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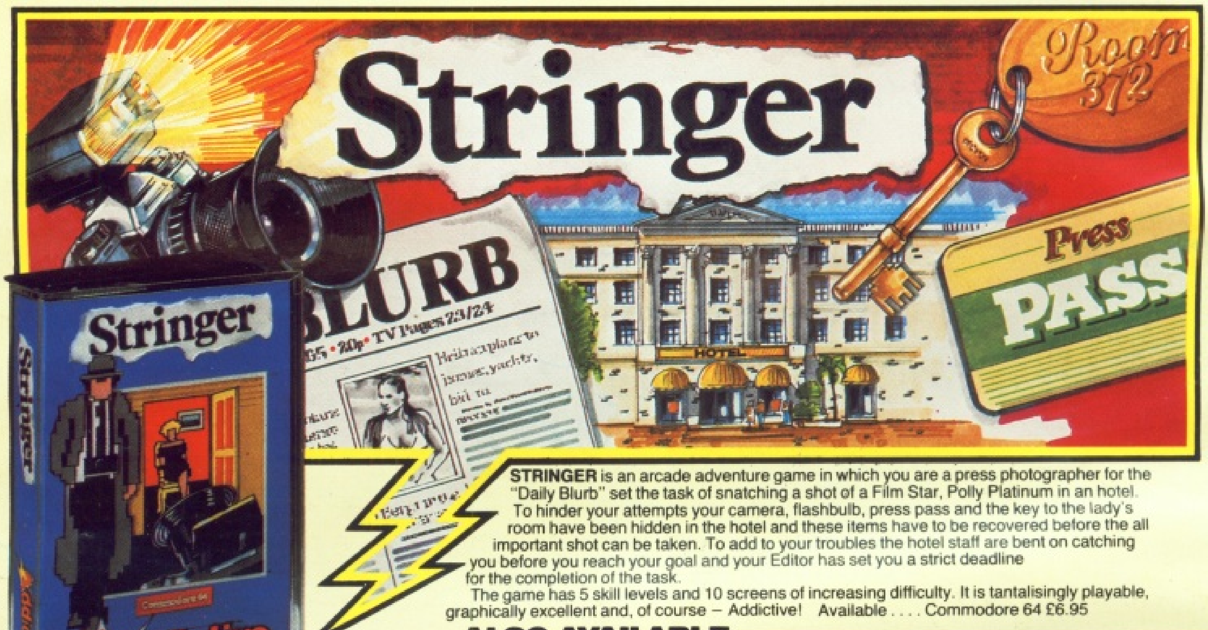

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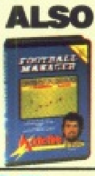

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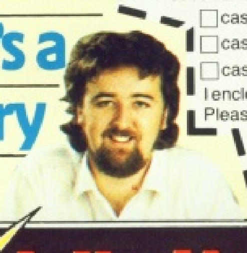

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August 1985

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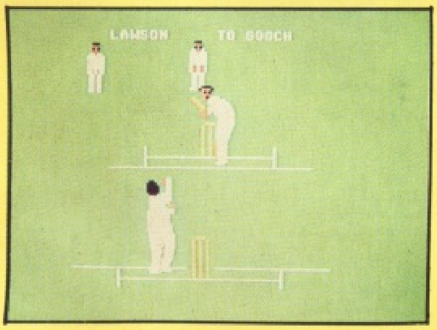

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Dear Reader

As someone said 'It puts flesh on the Commodore bones . . . .' The Commodore show (see the Report in this issue) was much more than a self-congratulatory jamboree. It brought together, in a concentrated form, the normally widely dispersed realities of Commodore's multi-faceted world. Many thousands of visitor, some eighty exhibiting hardware and software suppliers, exciting new products, a lively portion of razzamatazz – breakdancers, karate kings and showgirls on roller skates – and, of course, the real stars of the show Commodore's sparkling new machines.

CCI also had reason to be very pleased with the show. The Official Guide, which we produced and distributed free, was accounted the best ever and CCI's entrance stand with its especially attractive attendants, tee shirts, past issues, and other goodies, was always crowded.

In the past, Commodore has sometimes been criticised but this time gained universal approval for the exciting new computers on which they rightly prided themselves.

Particularly the stylish design of the 128 and the pin-sharp graphics of the 900 impressed greatly. All round, it was reassuring confirmation that CBM still leads the field.

At the show, CCI learned that Commodore plans to reinforce its position as the world's leading micro manufacturer with outstanding new software too.

You will be able to read about some exciting developments in coming issues of CCI – and take advantage of exceptional and exclusive special offers.

So as CCI's specially written Commodore song – the cassettes were a hot seller at the show – says 'If you've got a Commodore, you need CCI . . .' We hope to prove that truer than ever.

Sincerely

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...news ...news

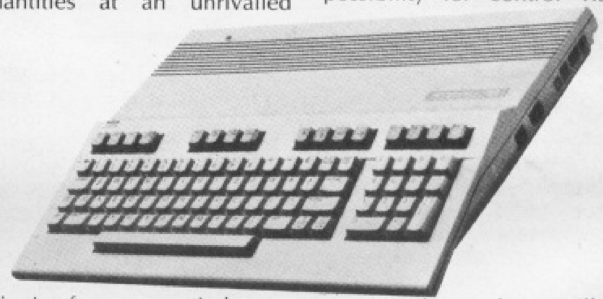
C128, C900 due out in autumn

Commodore UK is planning the major launch of its C128 and C900 Unix-compatible for sometime this autumn, probably September.

Both machines were on display at the Sixth International Commodore Show in June, however, in keeping with Commodore policy, slight modifications may still be made to specifications.

The C900 will come in two forms, Model I for single users and Model II for multi-user applications — up to seven at a time.

No specific date for the launch has been announced and probably will not be until much nearer the time. The same goes for price since Commodore's policy is to wait until the last possible moment to set one. "Commodore makes the entry into new market segments dependent on whether the moment for the marketing of large quantities at an unrivalled price/performance ratio has arrived," according to a statement released after the Hannover Fair in April where the new machines were first unveiled.



Commodore showed just how serious it is about the 900 by a last minute decision to exhibit at the 1985 European UNIX User Show in London in June.

The C128 with its three modes of operation will be accompanied by a new disk drive and monitor, both of which are "fully compatible with all Commodore's home computers."

The 1571 disk drive is a low profile 0.5 megabyte 5.25 inch drive which accepts single or double sided/double density diskettes. It has a built-in 6502 microprocessor, 2K of RAM and 32K of ROM, built-in DOS and includes a programmable format to allow CP/M software compatibility. In colour, it and the monitor are designed specifically for the 128 but will work with all Commodore computers.

The C900 will be a breakthrough into a much more sophisticated market for Commodore, allowing complex graphics applications and the ability of tying several users together efficiently. It uses the operating system Coherent, developed by Commodore and is entirely compatible with the trendy UNIX system of commands from Microsoft. Yet the operating system itself takes up only two megabytes of memory compared to eight or more with the usual UNIX.

The machine is the most powerful Commodore has ever come up with, featuring 512K of main memory expandable to 2MB. The Model I is a personal workstation suitable for Computer Aided Design with its 1024 by 800 pixel graphics resolution, windowing and possibility for control via a Mouse. The package will include monitor, Mouse, 20 MB hard disk, windowing software and video controller card with 128K of display memory.

Model II has a C Compiler, a Business Basic Compiler and more than 50 possible system applications. The hard disk in this case has a capacity of 20 to 67 MB and the floppy disk drive 1.2 MB.

Commodore also will offer a range of hardware and software add-ons.

New approach to soft aid

An Ex-Commodorite is looking into a new concept of selling PC software – locating sales, demonstration and distribution

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within larger stores with advice being readily available.

Mark Horne, formerly business systems and communications manager at Commodore UK, is experimenting with two initial SoftShops in London locations of Ryman stationers. The software handled ranges from word processing packages to the Microsoft Mouse to training software.

Horne calls them "specialist sales and information shops" and, as general manager, hopes to expand the number to 10 by the end of this year.

US Gold takes over Epyx line

US Gold looks to be the choice of American software house Epyx to take over its line in the UK and Europe.

Plans to expand the UK-Europe offices of CBS Software International for wider distribution of Epyx's successful games have been banished after CBS cancelled its deal to distribute Epyx software in the UK and Europe. Negotiations between US Gold and Epyx were taking place in June and a contract was finally signed just before press time.

CBS Records' UK office, which manufactures or distributes for major British software houses such as Virgin, Ariolasoft and Llamasoft, has been handling licensing, manufacturing, distribution and marketing of the Epyx line since December. A previous attempt under the CBS UK Publishing arm had been unsuccessful.

Epyx's quality games software proved a hit here and CBS' New York office told UK general manager Brian Hyams early in the year of plans to expand the operation to France and Germany as well as adding CBS' own line of computer software which is already available in the US.

Since then, CBS has taken a complete about-face and decided not only to terminate the Epyx agreement, but to cancel plans for its own line. Hyams says the decision was taken because of the instability of the UK computer market. The CBS line is primarily educational and business oriented and Hyams says: "That sort of software will not translate successfully to England".

He says the decision was primarily a change of policy on the part of CBS' New York headquarters, which wants to wait and see what happens in the UK market. "We've done very well (with Epyx)," he says. "We've had some very good success with some of their titles. There's just been a reformation of policy on CBS' role in the computer industry."

The CBS-Epyx agreement was due to terminate on 30th June and US Gold likely will take over immediately.

One small irony – CBS picked up the Game of the Year (1984) award for the Epyx game Impossible Mission at the British Micro Awards ceremony just two days before the new US Gold contract was signed.

Name change on adventures

American company Spinnaker has reacted to a potential copyright problem by changing the name of its science-fiction adventure series to Telarium.

Spinnaker originally called it Trillium but discovered that the name was already in use in the United States. Most titles, names, etc, used commercially are registered with a national office of copyright to prevent duplication.

The Telarium label includes titles Fahrenheit 451, Amazon, Dragonworld and Rendezvous with RAMA. Spinnaker also produces the Windham Classics line of adventures for younger audiences and several educational ranges including Spinnaker and Fisher Price.

Good Value

"The price of the 64 will NOT be cut," says Commodore's general manager, Nick Bessey.

Instead Commodore is giving away a cassette unit and a copy of International Soccer with every 64 sold! And that's not all . . . every 64 pack sold (and every C16) will entitle the purchaser to three nights' free accommodation for two people at over 300 hotels in Britain and on the continent.

Another 'value-added' package is intended to boost sales of the slow-moving Plus/4. The new package comprises the Plus/4, disk drive, dot matrix printer and the Impex 1,2,3 suite of business management programs, all at a cost of £499 — a saving of £198.

A peripherals pack consisting of a disk drive, dot matrix printer and EasyScript word processing software sells for £349 — a saving of £214.

A second peripherals pack comprises a disk drive, the Commodore Modem and a selection of disk-based software. This costs £229, a saving of £200, and includes a year's free subscription to Compunet.

CHICAGO... CES...

our American correspondent reports

They were only a short stone's throw away from each other at the CES Show in Chicago last week but they were worlds apart in style. Atari in a small mezzanine room with Commodore ensconced in a large silver phantasmagoria on the main floor of the troubled home computer industry American showcase.

Atari was showing a new mass merchandiser targeted 68000 based computer, the 260ST, with Commodore proudly displaying their long awaited C128. According to figures available midway through the show Commodore North America had received orders for about 100,000 units, the US list price being $300.

The Commodore marketing team are working to position the C128 as one of the majors within the industry. This is evident in the company's new commercials and magazine advertisements which picture it alongside computer giants such as the Apple IIe. Like Apple, Commodore is targeting a wide range of software including applications for small businesses and education users. Most of the American industry's analysts base Commodore's future on the highly touted Amiga PC, but the Motorola 68000 based machine has yet to be shipped and until then the 128 remains arguably the most critical piece of equipment in the suppliers' arsenal.

The C128 will be able to run the kind of productivity software that has been less important to the C64 than the Apple IIe. There has been a children's market and an adult market in the home but with very little overlap. Commodore feel that the C128, much like the IIe, may be able to appeal to both segments.

On a lighter note, for those of us who are still interested in C64 software, a number of the large US based companies were showing their latest offerings which are likely to hit our shores later this year. Amongst them is the long-awaited sequel from Access of Beach-Head entitled (believe it or not) Beach-Head II, in which "The Dictator Strikes Back", a multi-screen game with speech.

Some eagerly awaited news of Commodore's answer for the Macintosh, the Amiga, emerged at CES. The price set for the US is $1995, about £1570 at press time.

It has a 68000 micro processor with 256K RAM expandable to 512K and 192K ROM. The operating system Commodore is calling Intuition and includes mouse-controlled windowing capability and multi-tasking. The disk drive is built into the unit and takes 3.5 inch double sided, double density diskettes.

Three special chips give the Amiga capabilities for graphics, animation and sound and the disc drive operating system is Amiga-DOS. The Amiga'g greatest achievement may be its graphics abilities, enhanced with more than 4000 colours and a resolution of up to 640 by 400 pixels. For text, the screen gives 50 or 80 columns. Sound includes four channels over nine octaves.

Among the optional peripherals to go with it are a hard disk unit, modem, Midi music interface and a package for extended video capability.

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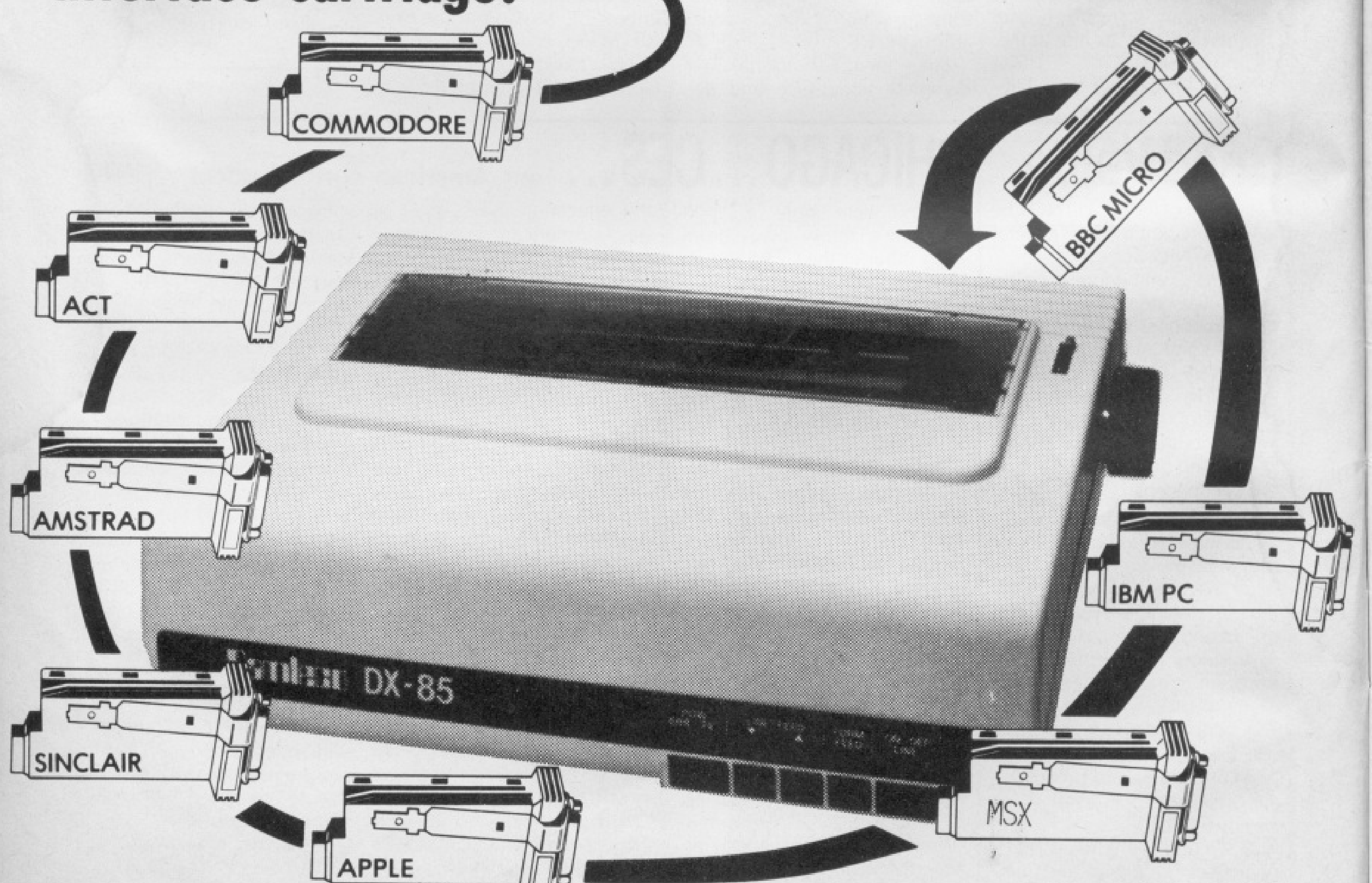

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PRINTERS

PRINTERS UNDER £500

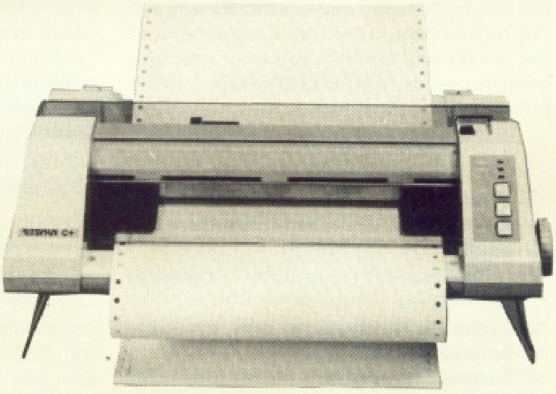
Thinking of buying a printer? With the number of printers on the market you probably won't know where to start. Bill Donald shares his experience of printer-buying, offering advice on what to look for and revealing that most printing needs can be satisfactorily met for under £500!

The range of printers available for the Commodore 64 used to be limited to those supplied by Commodore. The output from these leaves a great deal to be desired and with a print speed of less than 100 characters per second, they added insult to injury. In relation to their listed retail price, the present Commodore range, namely the MPS 801, MPS 802 and MCS 801 printers are uncompetitive and had Commodore acted earlier in this direction, the growth in interfaces to allow users to access other makes of printers would have never happened.

There are three industry standards for interfacing printers, although I use the term 'standard' loosely. These are:—

1. RS-232
2. IEEE-488
3. CENTRONICS

Most of the printer manufacturers who market printers under their own flag use one or more of these standards for the interface. In fact the higher quality (read . . . more expensive) printers will have the option of using some if not all of these, at additional cost, of course.



C.Itoh's Riteman C+

IEEE-488

The Commodore 64 uses a non-standard version of the IEEE-488 bus, in fact it has been said that any relation to the IEEE-488 on the Commodore 64 to the real thing is purely co-incidental. The Commodore 64 Serial Bus, which has it obvious origins in the company's accountants office (not the engineering department), can only transmit or receive data sequentially. The issue here is compounded by the data stream being only one bit wide (no, that is not a typing error). The true IEEE-488 will transmit at a full byte width, namely, eight bits and is thus a PARELLEL bus; the conclusion being that the Commodore Serial Bus runs at a speed of 12.5% of the real thing. The only way around this problem should you find yourself the proud owner of an IEEE-488 printer is to purchase the necessary interface. The most widely used and recognised being the INTERPOD, which at the time of writing adds a further £60.00 to the bill.

There are not many printers around that have the IEEE-488 as their interface, other than Commodore for their upmarket range of printers. HEWLETT PACKARD are the other great users of this standard for most of their peripherals including printers and instruments. (Although I think that if HP decided to market a pencil sharpener it would not be less than £50.00). The engineering quality of HP equipment is very, very good but their prices are never, never land for domestic users. If you are into linking your Commodore 64 to electrocardiographs or using it to run an oil refinery control room then the IEEE-488 interface demands your attention. The usual outlet for it being operating the 4040 or 8050 disk drives with the 64.

RS-232

The RS-232 interface is sometimes designated a SERIAL bus, although the course of time has made some fairly drastic changes to that definition. Considering that there is a book on the market designed to overcome the plethora of cabling arrangements related to the RS-232, any ideas of a standard are remote. It seems that every supplier of a device with this interface has their own ideas of where each cable (out of a possible 25) should terminate. If you do decide to buy a printer that is using RS-232, make certain that you have the pinout arrangements of both ends of the cable available. RS-232 is more of a handfull for the user since it allows transmission speed to be programmable and since the Commodore 64 will only allow a maximum rate of 2400 baud as compared with the IEEE-488 rate of 12000 baud with a suitable interface, RS-232 is best avoided for printers.

The Commodore 64 does not provide a true RS-232 interface. The point of access at the USER PORT is only at TTL voltage levels, namely 0 and +5 volts; RS-232 voltage levels are −12 and +12 volts respectively. So a voltage conversion unit is required, although constructing one should be possible for less than £10.00 and well within the capabilities of most of us. I mentioned the INTERPOD interface earlier, and this includes a RS-232 interface as well as an IEEE-488 interface, so it represents good value for money.

Centronics

The CENTRONICS interface is probably the most popular choice for printers. It was named after the American manufacturer of printers and is a PARALLEL bus. The vast majority of non-Commodore printers use CENTRONICS as standard and more than likely will be the one you use or end up with. It is cheaper to implement than the IEEE-488 because the connecting cable construction does not have to be so heavy, and is less complex than the RS-232. The majority of printer interfaces supplied for the Commodore 64 support this format. There are advantages to it in terms of the hardware connections. RS-232 can only come out of the User Port, similarly with IEEE-488 whereas CENTRONICS can be programmed from either the USER PORT or the EXPANSION PORT.

So, having exercised your neurons with the printer interface problem, what is there available for less than £500.00? The answer is very many, but first you have to define what you expect from your printer.

I always get upset when I see the old chestnut of dot-matrix printers being only suitable for program-listing and other menial tasks. My attitude is that a good quality dot-matrix printer has perfectly acceptable print. The daisy-wheel printers available for less than £500.00 are very much noisier and run at less than 20% of the speed of the good dot-matrix printers. I would not consider the purchase of one for those reasons, let alone the fact that the cheapest start around the £400.00 mark. Quite frankly they are typewriter technology, and I am prepared to wait for the advent of the laser printers which offer very high run speeds with excellent quality.

Remember that the purchase of the printer will represent your heaviest outlay in financial terms for hardware. So it is very important that you achieve value for money. The sort of points you are looking for are numerous, but above all see the printer in a demonstration. Remember that the printer will be with you long after you have moved on to your next micro. Use the following as a checklist:—

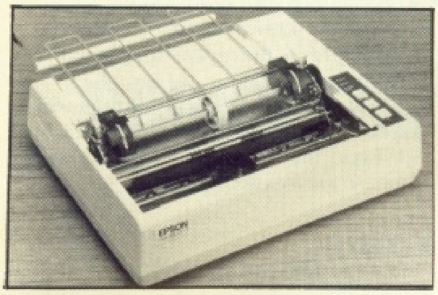
1. **Where is the country of origin? (the Japanese are reckoned to produce the best).**
2. **Is the manual (reasonably!) comprehensible?**
3. **Compare the features very carefully between machine.**
4. **Ensure that you have a demonstration of the modes that interest you using a Commodore 64.**
5. **Is the machine mechanically well constructed?**
6. **Make certain that the manufacturer has representation in THIS country.**
7. **Investigate thoroughly ANYTHING that appears to be non-standard.**
8. **Check that the supplier can, if need be, maintain the printer.**
9. **Find out the prices of consumables such as ribbons and print heads.**
10. **Is the printer capable of supporting the interfaces I want?**
11. **Can I live with this printer for several years?**

At this point, rather than provide you with a long list of printer specifications, which in any case are available elsewhere, I will go through the pros and cons of the printers that I looked at during my purchasing expedition. The printer market below £500.000 can be spilt into three clearly defined price bands, £100-£250, £250-£350 and £350-£500.

I will start with the EPSON since they are to dot-matrix printers what IBM are to personal computers — the market leaders — many printers are described as EPSON compatible. Before 1980 EPSON supplied the bulk of their production to OEM's, (original equipment manufacturers) such

BUYING A BASIC PRINTER WAS A
THOUGHT HARGREAVES IN ONE OF HIS

as Commodore and even IBM for 'badge-engineered' printers. The Commodore 4022 printer started life as the EPSON FX80 with an IEEE-488 interface.



Epson's RX-80 F/T

For versatility and control EPSON printers are hard to beat, in fact the whole area of printer control codes seem to be standardised on EPSON codes. Their quality of construction is very good and they retain a good record of reliability. In the very competitive price band of £250-£350 they face stiff opposition, but despite very few changes over the years, still manage to retain a loyal following.

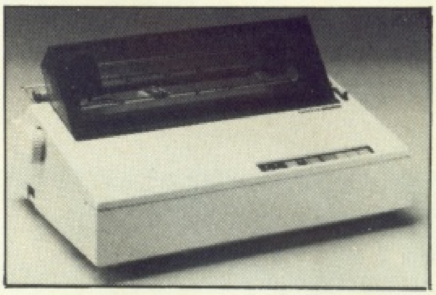
The two ranges in this field are the RX and FX series. The RX series are rated at 100 cps (characters per second) which is adequate for home use. Three models cover the RX range, the RX-80, RX-80F/T and RX-100. The −80 models are 80 columns wide (A4 width), whilst the −100 is 132 columns wide.

The RX-80, which is the base model has only tractor feed, meaning that the pre-punched edges serve as the means of pulling the paper through the carriage. The other two also have friction feed, which operates rather like the familiar typewriter since the paper is pulled through by pinching against the roller. There is the third option of a paper roll holder which allows a very economical method of printing. The FX-range are similar to the RX-range, the major difference being a print speed of 160 cps and enhancements to the graphics support. Unfortunately the FX-range are quite expensive and cease to be as attractive. For the money the RX-range offer a lot, the FX-range has very much stronger competition.

The competition

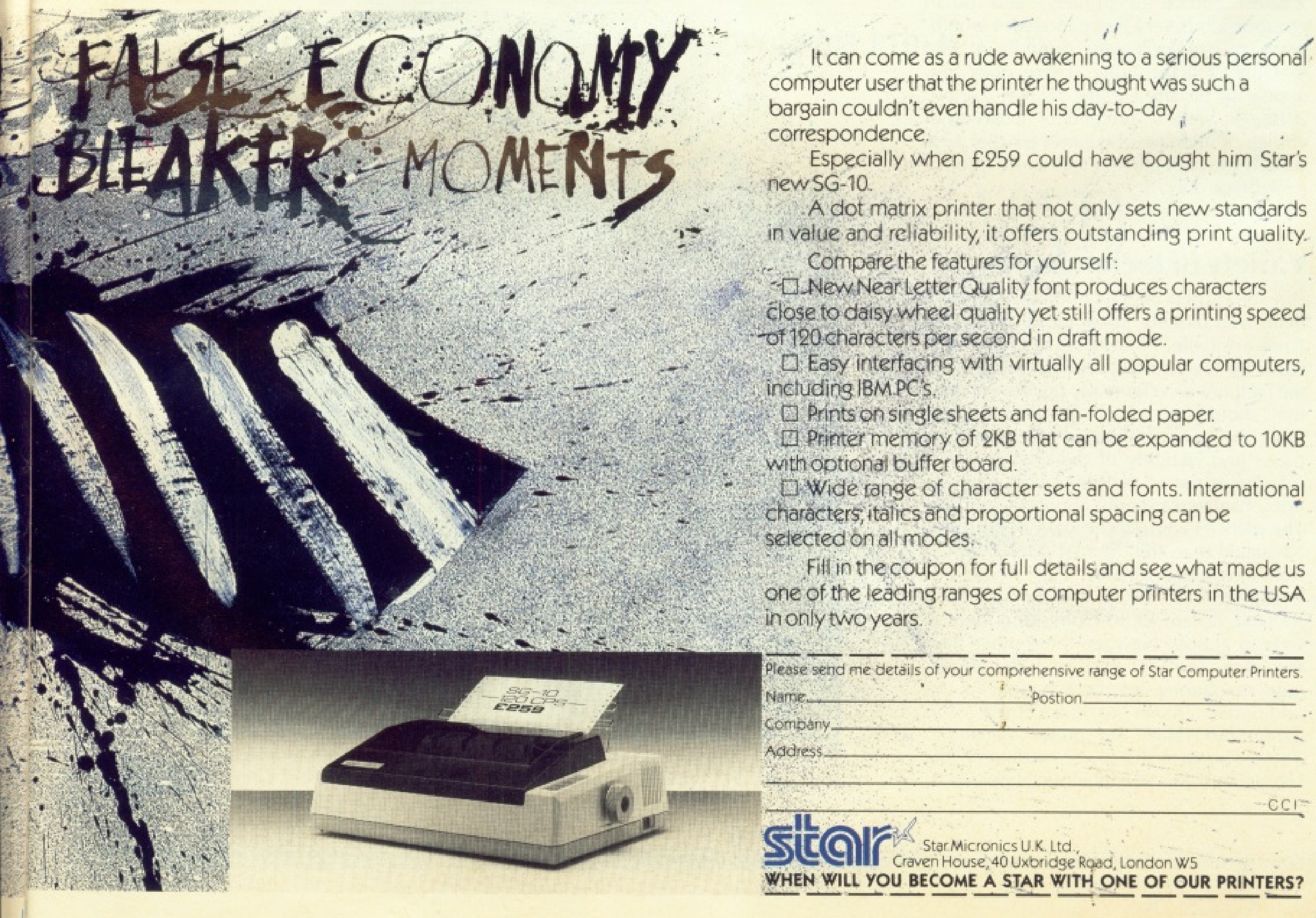
Perhaps the strongest competition to EPSON in the upper reaches of the sub-£500 printer market is from two companies CANON and SMITH CORONA. Their machines are newer designs that the venerable EPSON FX-range and are well worth a look. Probably on balance SMITH CORONA are the priciest but they offer paper feed through the machine base which makes for a very smart image. One interesting printer in this bunch is the CANON PW-1080A which offers a NLQ (near letter quality) mode, unusual in a dot-matrix printer.

The upper sector (£350-£500) also includes the colour dot-matrix and daisy-wheel printers. The JUKI 6100 rules the roost here amongst the daisy-wheels, although the BROTHER HR-15 is well worth a look. Check the range of available print wheels for each make of printer here, the greater the range, the greater the variety



Brother's HR-15

The £250-£350 sector does not have the greatest choice for dot-matrix printers. This segment seems to serve as the plateau between the home and serious printers. The key work here is 'Epson Clone', meaning employing printer control codes identical or close to EPSON. Other than of print fonts you will be able to produce. Colour dot-matrix seem to have a limited



It can come as a rude awakening to a serious personal computer user that the printer he thought was such a bargain couldn't even handle his day-to-day correspondence.

Especially when £259 could have bought him Star's new SG-10.

A dot matrix printer that not only sets new standards in value and reliability, it offers outstanding print quality.

Compare the features for yourself:

☐ New Near Letter Quality font produces characters close to daisy wheel quality yet still offers a printing speed of 120 characters per second in draft mode.

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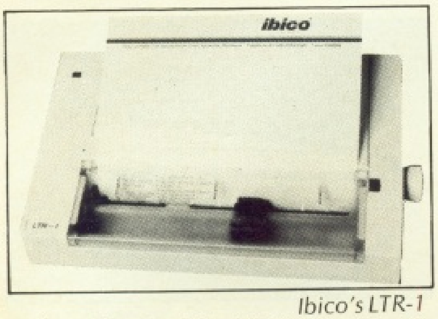
WHEN WILL YOU BECOME A STAR WITH ONE OF OUR PRINTERS?

market, most likely because of their price, however, if counterfeiting is another of your interests then the SEIKOSHA GP-700A and the CANON PJ-1080A should provide the wherewithal, although you will receive very, very little change from your £500.00!



Ibico's LTR-1

the ubiquitous EPSON RX-series the MANNESMAN TALLY 80 probably leads the pack qualitywise. The MT 80 is unusual in that it is West German in origin, mind you, the Germans are no mean engineers themselves, so do not let that put you off. I often think that this is a much under-rated printer and appears to suffer form poor exposure in the market. If you do come across one, I do not think you will be unimpressed. Judging by the number of times it is mentioned in the software operating manuals I have, the STAR GEMINI 10X seem to represent the most popular choice.

The £100-£250 sector provides the greatest choice of printers, and price competition is very fierce indeed. I would warn you to look very carefully at the machine specifications. There does not appear to be any clearly defined leader, although several pretenders exist. The choice of interfaces becomes smaller and usually the paper drive mechanism is fixed to one type only.

Variety of technologies

A variety of printer technologies abound here, with plotters, spark jets and thermal types available. Plotters are really of little value for text printing and this price level the facilities on offer really puzzle me why they should sell at all. Thermal printers have the twin drawbacks of expensive paper and stablility of the image over a reasonable period of time. Again, they are not considered a serious choice of printing. The spark jet whilst technically being more advanced than the thermal printer suffers from similar deficiencies.

The SHINWA CP-80 and the OKI MICROLINE 80 are RX80 clones and there is little to choose between them other than the price. The OKI does have the advantage of offering interface options at no additional charge to the buyer. The SEIKOSHA range are quite interesting. These represent the lower median of this sector, and this manufacturer appears to specialise in printers that will directly interface to specific micros such as the Spectrum, VIC 20 and Commodore 64. In fact the Commodore 1520 printer plotter is made by SEIKOSHA and also marketed by them under their own name. The disadvantate to this approach is the loss of control code compatibility, and limitations on the printer as a whole. For instance the character matrix on SEIKOSHA is very small which means of true descenders, ie the erasure of the tails on 'g', 'y' and 'j'.

Also in this price range are Samleco's DX85, Ibico's LTR-1 and C.Itoh's Riteman C+.

Recommendations

Remember to use the list of selection parameters. The prices for printers has now stablised and it is unlikely that they will fall any further. Be preapred to shop around and above all get a DEMONSTRATION using an IDENTICAL machine and interface system to your own. Do not be afraid to try out the software you intend to run on the printer. In the event that it will not work, then forget it.

Finally, for those who wish to know, I played safe and bought an EPSON RX-80F/T! If I had the choice over again I would purchase the following:–

£100-£250	OKI MICROLINE 80
£250-£350	STAR GEMINI 10X
£350-£500	CANON PW-1080A

Mannesmann Tally's MT80

I have tabled below the printers in the text with their pros and cons as they appeared to me, along with my recommendations of the best of each sector.

	FOR	AGAINST
SEIKOSHA GP-100VC	Commodore serial bus supported.	limited controls and output. Slow.
SHINWA CP-80	Epson RX-80 clone.	Price reflects print quality.
OKI MICROLINE 80	Epson RX-80 clone. Well supported by manufacturer.	
MANNESMAN TALLY 80	Good engineering.	Difficult to find in the shops.
STAR GEMINI 10X	Popular with software.	Same as for above printer.
EPSON RX-80F/T	The 'Cortina' of dot matrix printers.	Not very much
CANON PW-108A	A very good all-rounder.	Price.
SMITH CORONA D100	The best for the money	Nothing, if you can afford it.

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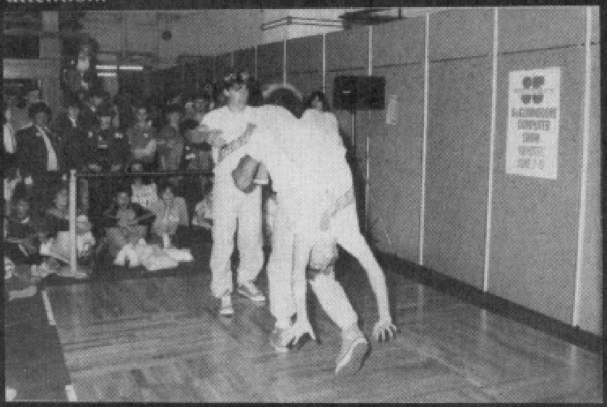
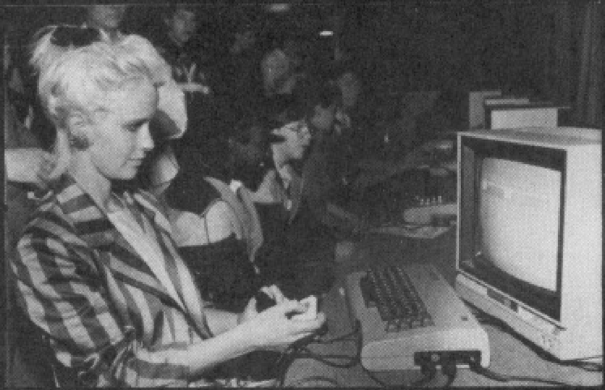
There was a lot of interest in Commodore's stand what with the PC10, PC20, C128 and C900 all vying for attention.



A popular attraction were the displays by breakdancing champions, the UK Warriors. They are seen here wearing the latest fashion trend — the CCI T-shirt . . . don't be seen without one!



Paula Yates, presenter of Channel Four's "The Tube," takes a crack at Commodore's newly launched International Tennis.

Behind the scenes: A hard life indeed, but which ones are posing?

commodore

C

The more than 15,000 pe ple
Annual Commodore Show Ju
from more than 70 compa es i
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Commodore itself played a leading role in most computing areas covered by the Sixth Commodore Show, and not only as a host. New computers, new games and new music utilities from Commodore begged attention at other exhibitors' stands as well as its own and raised the adrenalin level in the events room more than once as competitions raged throughout the three days.

Hardware included all the usual Commodore equipment plus some of the newest items such as the PC10 and PC20, C128 and C900 (see news section). But the highlight of the Show for CBM as well as many other exhibitors must have been music.

Musical notes

If you haven't yet explored the numerous possibilities of utilising music with your computer, some of the musical products shown at the show should tempt you.

By now most people will be familiar with the effects heard on many recent records (Paul Hardcastle's 19 being a prime example), produced by using digitally recorded sound played back in a variety of ways by the computer. Well, now it is possible to produce the same effects at home on your 64.

These effects are produced with samplers and three new samplers were demonstrated at the show.

Commodore's own sampler package, designed by Music Sales, includes software, a microphone, a hardware add-on cartridge which plugs into the 64's user port, and a complete user manual.

Effects are achieved by recording music, words or other sounds which can then be altered and played back over a 10-octave range.

Commodore's Sampler is scheduled for an autumn-release and will cost around £70.

Supersoft showed Microvox — a digital audio sampler and sequencer for the 64, SX-64 and 128, which can be controlled by MIDI. The package of hardware and software costs £199.95 and is available now. A version with a built-in MIDI interface will be available soon.

The third sampler being demonstrated was from Microsound. Using the 64's SID chip, the sampler costs £295 and includes a MIDI interface. Microsound also offers a polyphonic/monophonic keyboard which comes with software for £195.

Also on a musical note, Commodore introduced another new music package, the Commodore Sound Studio. Costing just £14.95, it turns the 64 into a professional music synthesiser and multi-track sequencer.

The Commodore Sound Studio was also designed by Music Sales and comes complete with

CI Reports

eople who attended the Sixth
w in June were met with displays
anies in games, business, music
the business. CCI looks at some
highlights.

an introduction to Sound Synthesis, written by musical expert Dave Crombie.

Finally, Island Logic is now making its music package, The Music System, available on the 64. It is an icon-driven program which combines the following features: synthesiser, keyboard, editor, linker, printout and song & sound library.

Doing the business

With the moves ahead in Commodore hardware, Digital Design and Development showed an interface to transfer data from 8000 and 4000 series Commodore computers to the new PCs.

The package of IEEE-488 to RS232 converter box and two program diskettes retails for £220 ex VAT. It includes connectors, power supply, main leads, manual and demonstration material.

The user inserts the program disk into drive 0 of the PET and gives commands to send the material over the IEEE bus and save it onto drive B of the PC. The software controls all conversions of baud rate, data format device, primary address and code conversion. Both input and output data go through a 1K buffer which can be expanded to 4K.

Supersoft showed several new packages for the 64 and C16 business user.

Word Perfect is a new word processor (you would never guess from the title!). Text is displayed in the format it will print and the program allows for up to 160 characters on a line. Available now on tape (£17.95), or disk (£19.95).

Instant recall is a database with a difference; information is held within the computer's memory so you can access any information instantly. Available on tape for £17.95 and disk for £19.95.

Blitz! is a Basic compiler available on disk at £49.95.

Supersoft also released a 64 version of its popular Disk Revealed disk repair kit. Costing £19.95 (disk), Disk Revealed works with 1541 drives or other Commodore drives connected via an interface such as Interpod.

Mikro Z80 is a cross-assembler enabling you to assemble Z80 opcodes on the 64. It is available on cartridge for £57.50.

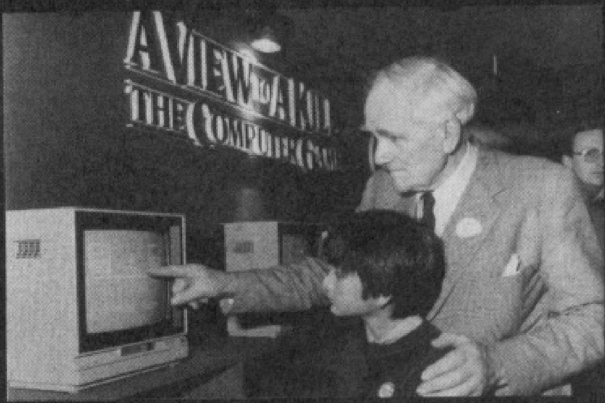
Modestly named the Ultimate Disk Utility, UDU contains over 30 commands to help you make the most of your disk. Available on disk only, at £19.95.

Finally from Supersoft comes a Printer Buffer capable of buffering up to 18K. It is available on tape (£12.95), and disk (£14.95).

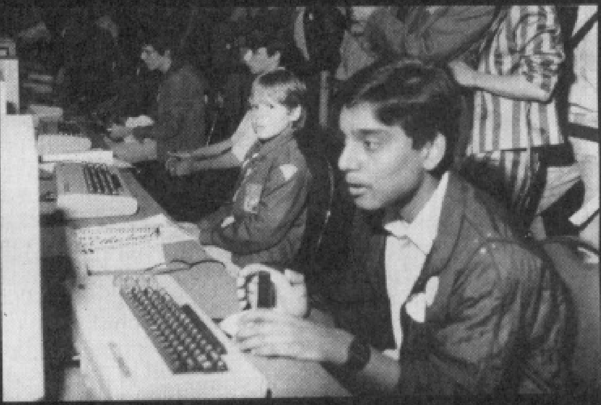
Precision Software has now made available its popular Superscript word processor for the 64. Superscript combines word processor, spelling checker,

C.C.I.
COMMODORE

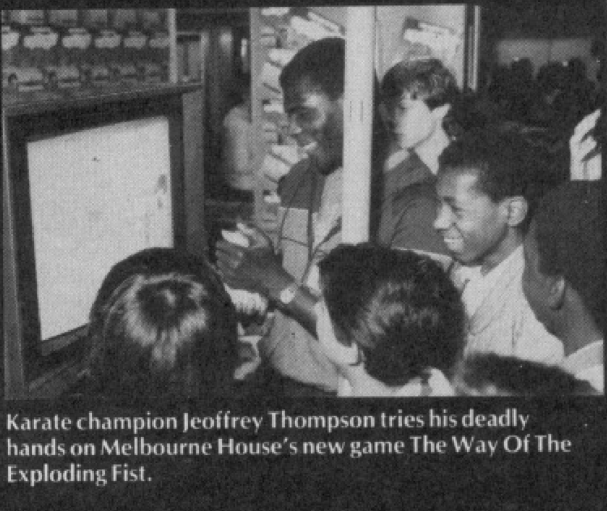
Smiling faces on the CCI stand greeted visitors to the show as they came in the door.



This man should know what he's talking about on the subject of James Bond — he is 007's Q, known in real life as Desmond Llewelyn. (What? James Bond not real life? Blasphemy!).



The Events Room was packed out the entire weekend as young and old accepted the challenges of the latest computer games.



Karate champion Jeoffrey Thompson tries his deadly hands on Melbourne House's new game The Way Of The Exploding Fist.

calculator and mailshot facilities. New features include an easy-to-use menu command structure similar to Lotus' 1-2-3. Available on disk for £69.95.

Arrow Micro Services showed a simplified database that stores records of your books and software titles and sorts the files by letter. It can then list a directory of all the records or those beginning with certain letters.

International

A sophisticated video-digitizer that works with the 128 and 64 as well as the PC10 was on display at the Print-Technik stand in the form of a cartridge and software package. It can be used with Koala Pad as well as on its own for a number of useful purposes such as blood or bacteria counts in medicine, recognising samples on a production line or alarm systems in which the digitizer compares one picture with a norm and raises the alarm if they are different.

The versatility of the package is reason enough to consider it and Print Technik, located in Vienna, Austria, hope to distribute the product in the UK soon.

A range of Arabic products for the 64 and 128 was the main attraction at JCL Software. An Arabic operating system actually makes the machine work in full English/Arabic bilingual mode. For example, programs entered in one language can be listed in the other and an Arabic BASIC program can include material in English, even written in natural left to right mode.

A wordprocessor is already available with printout possible on the Commodore DPS1101 or a bit slower on the MPS801/803. JCL also are preparing a bilingual database system to be available later this year.

Serious fun

One of the stronger elements of the show was games and users flocked to the stands to snatch up the newest releases.

Graham Gooch's Test Cricket was a highlight, particularly with the appearance of the star himself on the final day of the Show at the Audiogenic stand. Peaksoft also released a 64 cricket game, Tim Love's Cricket, and gave away £100 worth of software for the top batting score. The company also showed The Boss, a football management game.

COMPUTING INTERNATIONAL MAGAZINE

A major interest at the CCI stand was the free draw for a prize of a Commodore Music Maker and a Playalong Album. The Winner was Robert Shipway of Peacehaven, East Sussex.

The Events Room was humming on Friday afternoon with the sound of young people who took a crack at International Tennis, the newest Commodore sports game. Except they were playing against Roger Kitter, a John McEnroe look- and sound-alike. Also on the sporty side was Alligata Software which attracted attention with Knockout, a boxing simulation that lets the player program the moves his opponent will make.

Software Projects launched the 100-plus room Jet Set Willy II, the sequel to its very popular Jet Set Willy on the 64. MicroClassic took a new approach to chess with The Chess Game, the company's first try at 64 games software and a good one at that. Chess pieces actually work against the player who struggles from the beginning to figure out what the rules are. If that weren't nightmare enough, the colours flashing on and off will make you think so.

Handic introduced a 3D game that requires 3D glasses. Called 3D Roam: The Third Episode, it sells for £12.95 on disk only and features a worm-like robot that must remove energy particles being deposited in the planet's atmosphere. The 3D mode can be turned on or off but must be in the on position for the glasses to work with it.

The 64's younger siblings were not forgotten. Duckworth was selling the Plu/4 Adventure Pack, a combination of four adventures written and compiled by Peter Gerrard. They are Colossal Cave, the original adventure game; True Spit, set in the Wild West; Spaced Out, set in a "raucous bar full of ageing space heroes; and Underground Adventure. It comes on disk and includes an "Adventurer's Notebook" with tips and pages where you can record your movements.

Among the games to look out for after the Show was Robin Hood from Adventure International. The script follows closely, and takes the name of, the television series Robin of Sherwood which will be shown earlier this year on ITV and will be repeated this autumn. The price will be £9.95 on the 64 with the first installment available this summer.

(For more information on specific games, where to get them, price, etc, see our news section.)

Compu-shopping

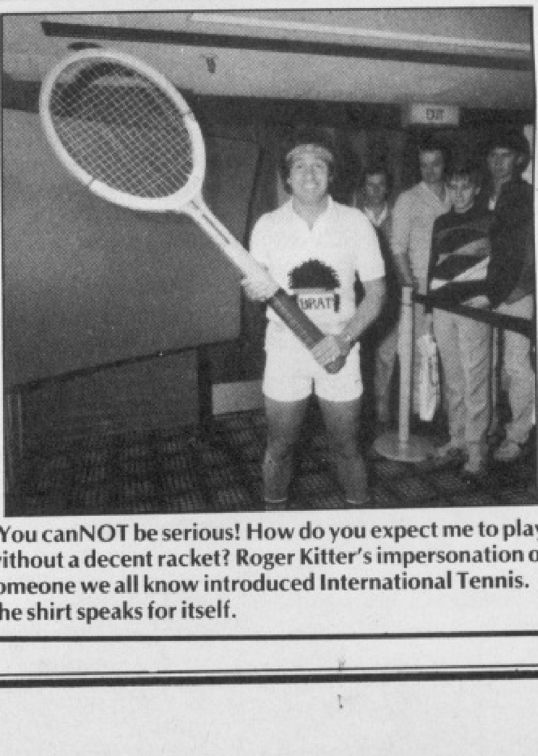
An interesting new service for comms buffs was one of the features of the Compunet stand — Comp-U-Store OnLine. It is a computer shopping service that guarantees savings and satisfaction or your money back.

New users can get a three month trial and beyond that pay £20 per year through their Compunet account for use of the service.

Comp-U-Store OnLine is run by Comp-U-Card Limited of Windsor, Berkshire, and claims to handle more than 20,000 "top brand name products." They range from televisions and washing machines to tennis rackets and microwaves.

Once you choose to buy a product, you order it directly via the computer and pay by cheque, Access or Visa. Delivery is within 2-3 weeks in most cases and costs nothing extra. The service guarantee says, "If you're not entirely satisfied with our service during your membership year, we will immediately refund your membership fee in full and without question."

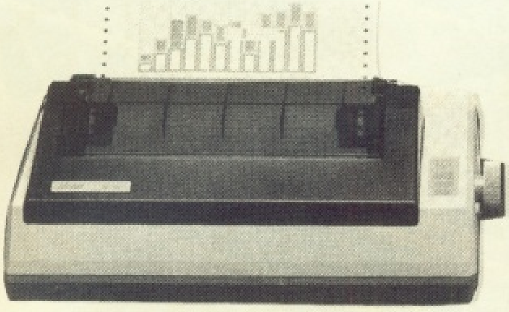
And that is just one of three parts of the guarantee. For more information, access Compunet and Goto Comp-U-Store OnLine at 310.



"You canNOT be serious! How do you expect me to play without a decent racket? Roger Kitter's impersonation of someone we all know introduced International Tennis. The shirt speaks for itself.

WE'VE GOT THE CANNON PW-1080 TOO!!

Yet another unbeatable deal from Datastar Systems!



STAR SG10

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features:—

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- 2K print buffer — expandable to 10K
- Commodore 64 version available shortly

Character Sets

96 Standard ASCII Characters
88 Standard International Characters
96 Italic Characters
88 Italic International Characters
96 NLQ Characters
88 NLQ International Characters

Character Matrix

Standard Characters: 9 dot × 11 dot
STAR Block Graphics: 6 dot × 6 dot
IBM Block Graphics: 12 dot × 11 dot
User Defined: 8 dot × 4 to 11 dot
Near Letter Quality: 17 dot × 11 dot

Character Fonts

Normal (10 CPI)
Elite (12 CPI)
Condensed (17 CPI)
NLQ (10 CPI)

Line Spacing 1/6, 1/8 in. or 7/72 in. Standard

Dimensions (W × D × H)
392 × 315 × 145mm (15.4 × 12.4 × 5.7 in.)

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Print Head 9 Wires (User Replaceable)

Star SG-10 £259 + VAT	**£297.85**
Parallel cable for any Micro (max. price)	**£20**
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2000 sheets of continuous listing paper	**£15**
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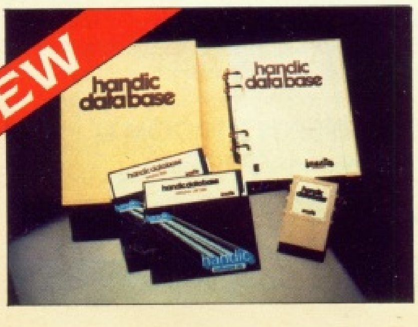
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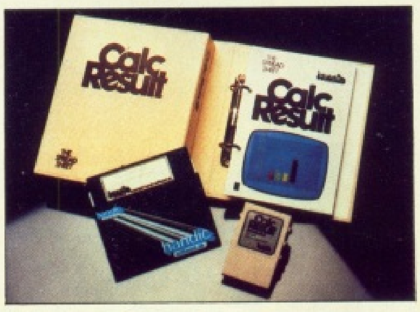
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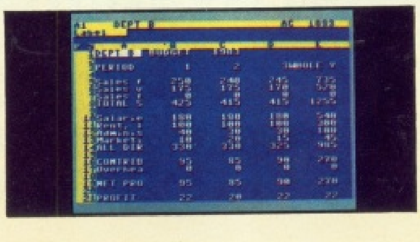

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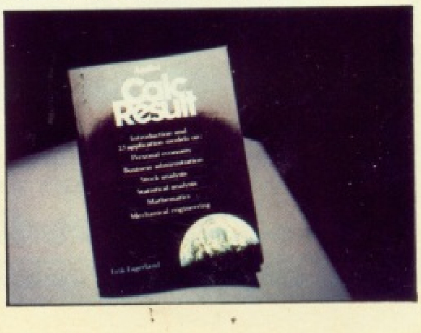
Applied Calc Result

THE Handic supermarket basket is full of 'goodies' for your Commodore 64. Here is a brief description of what they all are! Don't forget – if you need any more information, either clip the coupon (and tick column 'A') or give us a ring.

1 Mon 64
An outstanding Machine Code Monitor (cartridge based)

2 Teledata
Communication cartridge for use with the CBM 64, link up with Databases like the bank or supermarket, over the telephone lines.

3 Superbox 64
An expansion unit for the Commodore, which features three independant cartridge slots; IEEE interface that is totally transparent; has multi-user capabilities with IEEE; and a re-set switch which activates a cold start on the computer. This unit will connect up to 3 cartridges at the same time, which makes frequent altering between programs simple and reduces wear on the cartridge slot.

4 Vic Rel
Vic Rel (Rel 64) is a relay cartridge for the CBM 64 and Vic 20 which has almost limitless applications, such as control of burglar alarms, garage doors, door locks, electric radiators, lamps , transmitters, model railways, etc.etc.

5 Disc-based games
Handic have a set of disc based games for the Commodore 64, all are great fun and superb colour graphics. At around 9.95 each. Why not treat yourself to a few?
Quantity discounts are available on request – dealer enquiries are also welcome.

6 Diary 64
An ideal program for keeping track of telphone numbers, addresses, appointments, schedules, in fact the ideal time manager for all you sieve-heads.

7 Stat 64
The statistical CBM cartridge which ads 19 new commands to your Basic language. An excellent programming aid for all you statisticians.

8 Graf 64
A CBM cartridge that turns solutions of equations into graphical analysis, what you might call a plotter-jotter.

9 Handic Auto Modem
This modem is the expanded version of the Videotex modem (see illustration). When used together with the Handic Teledata Base 64 this unit enables you to set up your own data base with information.

Videotex Split-Speed Modem
This Split-Speed modem is especially designed to connect with computers over the telephone lines, its facilities include auto-dialling, line control, etc. (BT approval applied for).

10 RS232
A standard V.24 (RS232) interface for connecting the CBM 64 to printers and other peripherals.

11 Bridge 64
A cartridge bridge game for the intelligentsia.

12 Forth 64
A Forth generation programming language for people who know what they are talking about, and want to know even more.

MON 64
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Checklist

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REL 64	34.95	☐	☐
MON 64	39.95	☐	☐
GRAF 64	29.95	☐	☐
FORTH 64	34.95	☐	☐
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STELLAR CONFLICT	12.95	☐	☐
IMAGINATION	12.95	☐	☐
REAL ESTATE	12.95	☐	☐
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6M CABLE	7.94	☐	☐
12M CABLE	9.89	☐	☐
SUPER BOX	67.87	☐	☐
RS232 INTERFACE	39.42	☐	☐
RESET SWITCH	5.98	☐	☐
APPLIED CALC RESULT	14.95	☐	☐
NEW HANDIC DATA BASE	**62.00**	☐	☐
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CALC RESULT 700 SERIES	258.75	☐	☐
WORD RESULT 700 SERIES	258.75	☐	☐
HARDWARE			
PET SWTICH MOTHER UNIT	172.50	☐	☐
DAUGHTER UNITS			
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Let Your Fingers Do The Walking!

For any microcomputer user the ability to type with accuracy and speed is a big asset to word processing or any other kind of input via the keyboard. Jennifer Goldsmith takes time off her work at ICPUG to examine a selection of packages for the 64 which teach you to type.

PITMAN TYPING: KEYBOARD SKILLS

No manual is included with this program, but there is a progress chart so you can keep a record of your accuracy and speed for each practice exercise.

The exercise menu covers four screens and comprises drills and practices. The drills are to introduce you to the new keys which you can become familiar with without the pressure of being timed.

In the drills the cursor covers a character and you are expected to hit the correct key — with the correct finger. If you press a wrong key, a bleep informs you but if you press the correct key with the wrong finger, you get away with it! This is one of the snags with self-tuition. Another small gripe here — it would have made it easier to spot the cursor had it been a contrasting colour.

In the practice sections you type a short line of words, pressing return at the end of each line. This is similar to Master Key and Supertype except that here a line of words is only about 20 or so characters — not a whole line.

Generally speaking, Keyboard Skills is not a bad program, but one may have expected something better from Pitman with all its experience. It is available on disk (£13 ex VAT) and cassette (£8.65 ex VAT).

Contact: Pitman Publishing, 128 Long Acre, London WC2E 9AN. Tel: 01-379 7383.

MASTER KEY

Available on tape, Master Key costs £9.95 and comes in an illustrated box. It is aimed at the student or the professional person who wants to be able to type.

A fast loader is incorporated and, once loaded, a pair of hands are displayed which appear to be dancing to music. Press any key to continue and the contents are displayed.

The contents screen lists instructions and offers a selection of exercises to choose from.

As soon as you have selected your exercise, the first line for you to type appears on the screen. The clock (not displayed) begins as soon as you start typing.

If you make a mistake, your error is highlighted on the screen and an audible noise generated. At the end of the line, press return and your accuracy and speed are displayed at the top right of the screen. Line two then appears.

There are six lines to an exercise, but your accuracy and speed are averaged from the minute you start, so don't stop for a chat between lines or else your speed will fall!

At £9.95, Master Key is a useful, stress-free typing course and is a good introduction to typing for non-typists.

Contact: Longman, Longman House, Burnt Mill, Harlow, Essex CM20 2JE. Tel: 0279 26721.

SUPERTYPE

Supertype provides a very comprehensive approach to touch-typing. Available on disk or cassette, the program comes complete with a 50-page exercise book/instruction manual in the form of a shorthand notebook. The screen is user-friendly and the manual explicit.

Incidentally, the manual can be propped up next to the screen for convenience.

An interesting approach to teaching which finger relates to which keys is the concept of coloured stickers. Each finger is given a colour and the keyboard is divided up into coloured areas for each finger.

Don't worry if you only have a black and white monitor, Supertype teaches you to type from the colours on the keyboard, in the manual, and of course your mind.

Another useful feature is the inclusion of a metronome in the first part of an exercise, which teaches you to build up a steady rhythm.

The exercises are copied from the book onto the screen as in professional typist courses. This is good practice as in real life a copy typist types from the written word.

The initial exercises are 12 lines in length, each line being exactly 40 characters, so there is no need to press return. This is also a good idea as word processing packages do not need return to be pressed.

Mistakes are indicated after each line, but typing speed and accuracy are not shown until the whole exercise is completed.

Despite its price of £25.95, Supertype is a professionally designed program — even to train typists and costs less than attending a typing course.

Contact: Precision, 6 Park Terrace, Worcester Park, Surrey T4 7JZ. Tel: 01-330 7166.

TYPE-SNYPER

Type-Snyper is available on tape or disk and is written in machine code.

Although its aim is to teach you touch-typing, it does not really succeed there.

Type-Snyper is basically a game utilising excellent colour and sound. Words or short sentences drift down the screen to their destruction. You have to type in the corresponding characters before it hits the bottom of the screen. As each character is typed in correctly, a balloon bursts and the character floats back to safety.

It may be a fun way to get to know your way around the keyboard, but there is no instruction as to which finger should go on which key. It is also difficult to increase the speed in early lessons.

As a keyboard familiarisation game, Type-Snyper would be good for new micro users who are not used to a QWERTY layout.

The disk version costs £14.95 and the tape version £9.95.

Contact: Tymac (UK) Ltd, Unit 78, Gravelly Industrial Park, Tyburn Road, Birmingham B24 8ZL. Tel: 021 327 6637.

CCI

CP/M and the C128

The new Commodore 128 has CP/M and this will open up a whole new area for the user. Bill Donald answers some of the questions you may have about CP/M, as it is likely that many of you have not either seen or used it before.

CP/M is an OPERATING SYSTEM. It is not a programming language, as I have heard one dealer describe it to a prospective buyer! In effect, the C128 KERNAL ROM which holds the code for the machine's operation in native 6502 processor syntax, is switched out and replaced with the code for the Z80 processor. This code is not held in a ROM, but is loaded into the machine from the CP/M System Disk.

What is the System Disk?

The system disk contains the bootstrap loader program for configuring the C128 to a CP/M machine. This program is written in 6502 code which switches on the Z80 processor and switches off the others. The Z80 then continues the process of loading further configuration code, this time in Z80 form. The machine can now read or write only Z80 based code. The system disk also contains the various utilities which are supplied as part of the CP/M system. These include an assembler, simple text editor, monitor and file transfer program amongst others.

Why do we have to use a Z80 processor?

In short, for historical reasons. Way back in the Jurrasic (or dinosaurs, if you like!) period of microcomputers in 1973 the very first microprocessor was made commercially available by INTEL. This was the 4004, which was a 4-bit processor. As things developed this was superceded by the 4040 which had an enhanced instruction set, until finally the limitations of a 4-bit chip were swept away with the introduction of the 8008. This series of 8-bit processors followed the same pattern of development, ie 8008--‹ 8080--‹ 8085--‹ Z80.

Very soon after the introduction of the 8080, it was realised that the use of these relatively powerful processors would be limited without some means of standardised control. The year 1975 arrived and a former employee of INTEL (who apparently were not interested) expanded this concept by developing what is now known as CP/M.

Can any Z80 based micro run CP/M?

Theoretically yes. CP/M has a structure of code which makes it possible to transplant easily on Z80 machines: The three basic elements of a CP/M implementation being the CCP (Console Command Processor), the BDOS (Basic Disk Operating System) and finally the BIOS (Basic Input/Output System). These are laid into memory in a co-ordinated sequence with the users program area always starting at $100. The latter is termed the TPA or Transient Program area. The machine's Zero Page is additionally reserved for CP/M.

Of the three elements, CCP BDOS and BIOS, only the BIOS source code has to be specific to the machine in question. Since this is held in RAM on the C128, it is perfectly possible (provided you know your way around CP/M) to edit or rewrite the BIOS to include customised routines or change the parameters of the peripherals, if for instance, you decided on increasing the number of disk drives or include a daisy wheel printer.

How do you recognise when the C128 is running in CP/M mode?

If the C128 has already booted-up the system disk then look carefully at the cursor. You should see the following if the machine is running CP/M:—

A‹

The "‹" is flashing and this is the CP/M prompt. The "A" signifies that the user is utilising disk number A. Note that the vital thing about using CP/M is that you are ALWAYS logged on to a disk. This is of fundamental importance in grasping how to operate in the CP/M environment. If the system disk is booted up from a cold start you will see on the monitor, the copywrite notice from Digital Research Inc as well as the system size in bytes.

Digital Research is the company formed by Gary Killdall, the originator of CP/M after he left the disinterested INTEL company. Seemingly every industry has its parallels, and the CP/M and INTEL story always reminds me of the wretched Decca Records Co. executive who gave the thumbs down to a recording contract to the Beatles in their formative days, he did not think they would be a success commercially! DR quite cleverly, do not SELL the CP/M system, but license it to the users such as you and me. This is the purpose of the registration card, and although registered users are informed that they will be kept up to date with developments in CP/M, I do not think I would be alone in saying that this side of the bargain is definitely not kept, (please note that point Digital Research UK).

Is CP/M easy to use?

The answer to this one is probably bound up with what you have been used to. If you used computers before 1980, then the answer will be yes. CP/M has been around for a very long time in computer history time scales and therefore represented the state-of-the-art during that period. These days, particularly those of us who have been used to Commodore micros, expect full screen editing, simple file transfer techniques between peripherals and comprehensible disk error messages. These are not part of the CP/M system. Hence it is not without reason that the other name for CP/M is 'Confuses People Most"!

The clumsiness of the system can be overcome to a large extent by the software which is available for it, but CP/M has never won any award for user-friendliness.

If it is that bad then why have Commodore selected it?

In the deep dark recesses of the corporate mind of Commodore, the answer will be money (meaning more of it for Commodore). Because of its age, it represents an established operating system which has had most (note the word MOST) of the bugs ironed out. To develop from scratch an operating system costs millions, and since this would be built on to a technically obsolete 8-bit chassis in the shape of the Z80, there is your answer.

It is rather analogous to the motor industry, where similar financial constraints apply on developing engines and gearboxes. You, the user are not interested in the fact that the Austin Maestro gearbox is made by VW and is used also in the VW Golf, or that the Ford Granada diesel taxi taking you to the station has an engine built and used by Peugot Talbot.

The same benefits of spare parts availability extends back into the microcomputer world in terms of software availability. In other words, the economies of scale resulting in the use of standardised operating systems reflects a function of the amount of available software.

What sort of software is available?

Other than hard core pornography or aspects of Cartesian philosophy, there is a piece of CP/M based software for 99% of all applications! The beauty of CP/M software is that there is a huge, and I mean huge, amount available in the public domain. Like most public domain software very careful filtering will reveal the little gems, but bear in mind that the bulk of it is now old hat in programming terms. Greater than 75% of it has originated from the USA, which accounts for the heavy American overtones in some areas.

The public domain software writers of pre-1981 did not have the Commodore's, Atari's or Spectrum's at their disposal and in the main aimed to produce serious programs for their machines running CP/M. If they did produce any games they tended to be more directed at the educational area, so don't look for arcade hits. Most of the best games appear to be adventure types. The majority of the so called business programs in the public domain have no real use to European users since they are based on American corporate practice. The same applies to the communication programs which use the Bell Telephones system's frequencies and only support 300 baud (ho, ho).

However, if you are into programming both at high level and at assembler level then the rewards are overwhelming. Virtually every programming language known to man is implemented on CP/M and if the inclination takes you, then the skies are the limit. Get hold of back issues of Dr Dobbs Journal (Foyles Bookshop, London) and you are on the way to some REAL programming.

It is a peculiarity of CP/M that the standard system assembler only supports 8080/8085A op-codes. This has the advantage that you are introduced (assuming you know 6502 code) gently into Z80 land since 8080 code is really a cut down version of Z80 code. However, there are many Z80 assemblers in the public domain.

What about commercial software?

Yes, what about it. Remember how you winced when you bought SUPERBASE at £80-£100, well forget it when it comes to buying commercial software. Those boys are charging £200 upwards and unless they change their tune, pricewise, then they are not going to be making money from your author. I pay that sort of money for HARDWARE, not software!

What is available is good: WORDSTAR represents the leader in wordprocessors with DBASE11 holding the flag in databases, the ubiquitous VISCALC carrying the honours in spreadsheets. However, the purchase of that little lot will leave you very little change out of £1000! It would seem that an application program for anything is available under CP/M, but it is sold on the assumption that you have PLENTY of money.

Where can I get this public domain software?

The best source is the CP/M User Group (I will give the address at the end of this article). Note that they can only supply the software on 8 inch disks, although they can also offer a copy service which caters for 5.25 inch disks. The costs for this service are less than £10 per disk and since the disks hold more that what we are accustomed to in the way of 1541 disks, this represents extremely good value for money.

Needless to say, you have to be a member of the group to gain access to the CP/M library, but since this costs £7.50 per year (for private individuals), the whole exercise is financially painless. If you do not wish to wait too long for the disk, then there are other commercially run sources of public domain CP/M software who can usually be found in the small adverts at the end of the non-specific microcomputer magazines.

The amount of public domain software can be gauged from the following facts. The CP/M User Group library has a total of 173 volumes. Since these are all 8 inch disks holding up to 241K of data, you can see there are no small quantities involved. If you really want to get into software I would suggest that you join the specialist group of the New Jersey Amateur Computer Club in the USA. Their library has 217 volumes as of January 1985.

I would ask you to bear in mind that, in common with all user groups, they are run by volunteers and that delays may occur in fulfilling your requests. Any correspondence should include a stamped addressed envelope, and remember, do not take these people for granted, they are not paid for their work. Similarly, a user group is only as good as its members, so if you do come up with a useful program, then put it into the library.

What can CP/M do on the C128?

Because the C128 can bank-switch 64K into RAM and support 80 column display, the prospects with CP/M are very good indeed. The bulk of the software, both public domain and commercial is written with 80 column display in mind. Do not expect fancy graphics in terms of colours unless you are prepared to add to the program machine code.

The 64K RAM is a strong feature of the C128 since this is the maximum size of RAM that CP/M can cope with, unless, once more, you are prepared to dig around the BIOS. The disk format represents no problem since Commodore have at last recognised that they must follow the market. The Osborne disk format selected by them in the CP/M mode must be one of Commodores better decisions, since it is a very popular disk format for CP/M.

The whole problem of disk formats arises from there being no industry standard for 5.25 inch disk. For the 8 inch disks, the problem does not arise since there is a standard, the one established by the originators of floppy disk drives, IBM.

At the time when the smaller 5.25 inch disks became available IBM were not involved with the personal computer market. The microcomputer manufacturers did, in the main, continue with the IBM technique of using frequency modulation as a means of storing data on floppy disks. Unfortunately, Messrs Apple and Commodore decided to use the group code recording method which resulted in total incompatibility with everyone including themselves. Ironically, Commodore do use a variation of FM for data storage . . . on the humble C2N cassette unit! However, they have seen some of the light, and for the C128 a standard disk format is used (in CP/M mode only). Needless to say, the Commodore IBM-PC clone is fully compatible and uses the industry standard MS-DOS, they obviously were taking NO chance with that machine.

Can the C128 be linked to the C64 running CP/M?

There are no insummountable reasons why not. The two could be linked together through their User Ports and files transferred given that there is a resident file transfer program which defines the C64 as a listener, and the C128 as a talker.

This can overcome the great problem with running the C64 under CP/M due to the total lack of software for the machine in this mode.

Will the C128 support printers other than Commodore when running CP/M?

The answer here is a reserved no. By this I mean that the C128 will not directly connect to a Centronics type printer such as the Epson RX series other than through the User Port and with some programming. Do not worry though, one of the first programs you will get involved with if you decide to modify the BIOS will entail a printer routine. In fact the BIOS will already incorporate code for this, it just needs slight changes.

I thought CP/M was dead. Surely this is a retrogressive step?

No, good old CP/M refuses to lie down and die. It has its good points as well as the bad. Although the detractors of CP/M can point to better operating systems such as GEM, MS-DOS or even TOS, they fail to recognise that these are meant for 16-bit machine environment. More importantly, none of these can match the utter weight of AVAILABLE software, which ultimately, does, for better or worse, determine the life expectancy of any microcomputer.

There are a number of very good books on CP/M and, with the editors permission, I hope to provide a review of these soon. The user group mentioned in this article can be contacted at the following address:— CP/M Users Group (UK), 72 Mill Road, Hawley, DARTFORD, Kent DA2 7RZ.

CCI

Book REVIEW

Bill Donald and Jennifer Goldsmith evaluate a selection of newly-released computer books

TOP DOWN ASSEMBLY LANGUAGE PROGRAMMING FOR YOUR VIC 20 AND COMMODORE 64

by Ken Skier — £14.95.

I don't know if the author was after an entry in the Guiness Book of Records for "the computer book with the longest title", but he must be very close! Perhaps more importantly, do not let the title put you off buying it. The book gets off to a good start on the cover, which proclaims that an 8K expansion RAM is required for VIC users, quite thoughtful that. Rather like the feeling of childhood days of rushing home from the shops on Saturdays with the latest aeronautical masterpiece from Mr Airfix only to discover no glue!

The general idea behind this book has, I am sure, been cribbed from Levanthal. The book is very much machine specific and the first 200 pages cover assembly language programming. The author pushes little routines at the user, although these are source code only at this stage, and gives a very detailed explanation of each in terms of what he wants the routine to do and how it executes.

I would imagine that this book plus 6502 Assembly Language Programming used in tandem would serve VIC 20 and C64 admirably. The deficiencies in this book in the way of the construction of the language would be offset by Leventhal, who's own book could be given realism by the routines demonstrated here. The final 200 out of a total of 400 consist of source and object code listings of several extremely good machine programmers tools. These are a text editor, monitor and several other useful programs to ramble amongst the bytes.

The thoughtfulness which characterised the book's cover is carried over into these listings. There are separate data tables for the VIC and 64, even the basic loader equivalent programs are given for those without the benefit of a assembler. Naturally you will be lucky if you have typed in everything correctly, and this gives you an ideal opportunity to practice the black art of debugging. I have had some people say that lengthy programs like these put them off; the crashes and laborious entry. I feel that debugging is the real skill of successful programming, you can learn some very good routines or observe unusual effects through typing in the wrong thing!

The author has a computer documentation background and this is reflected in the easy style of writing — I liked it. These two books proved the point that it is possible for an American author to write in a manner that assumes a mental ability of the reader being in excess of 12 years of age, unfortunately, many of them cannot or will not. The one little nugget in there which sticks in my memory is an oldie but goodie, 'the computer is not smart, it is the programmer who is the smart one'. Remember that when you start thinking of giving up.

Contact: McGraw Hill Book Publishers (UK) Ltd, Shoppenhanger Road, Maidenhead, Berks SL6 2QL. Tel: 0628 2341.

BD

6502 ASSEMBLY LANGUAGE PROGRAMMING

by Lance A Leventhal – £14.95

Assembly language or machine code — the terms these days are virtually synonymous — is generally accepted to be very heavy going. Not only does the pupil have to grasp the principles of each set of op-codes for the plethora of a cpu's about, but also has to be extremely familiar with the hardware of their own machine.

The 6502 is reckoned to be the easiest to learn of all the 8-bit processors around today. Certainly when comparing the number of op-codes to those of the Z80, things take on a brighter aspect. I would think that it is probably the various types of addressing modes with the 6502 series that catch most people, although a lot of them are never used. Unfortunately, there is no easy way of learning assembly language other than not giving up. Believe me, it is well worth the effort!

This particular book whilst not being machine specific, gives the ground a very thorough going over. It is not cheap, but the number of pages coupled with the high standard of typography and setting out make it a standard work on the subject. The author takes the user through the theory of computer languages, then into the different definitions of assemblers. These are covered exhaustively, similarly with the op-codes and addressing techniques.

Then we move into the real meaty parts of simple assembly language programs. We run the full range of loops, code conversation, arithmetic, data tables and lists, finishing with subroutines. The program examples are beautifully laid out, with full explanations of the purpose of the program, visual algorithms where necessary with source and object codes.

At chapter 11 (there are 16 chapters in total) input/output concepts are introduced, which revolve around the 6522 VIA chip, although the 6520 PIA and 6551 ACIA are not ignored as well as some other 65XX series chips. There two useful chapters on debugging and program design, and for the professional programmers a chapter on documentation and redesign.

This book is part of a series covering the other processors in common use. I have yet to see anything yet published that gives such in-depth treatment of the 6502. In fact I was so enthusiastic about this book that I purchased some others in the series, the 8080/8085A and the Z80 (OK so what if I do like CP/M). A strongly recommended buy, without doubt the standard reference work on the 6502.

Contact: McGraw Hill Book Publishers (UK) Ltd, Shoppenhanger Road, Maidenhead, Berks SL6 2QL. Tel: 0628 2341

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PROGRAMMING THE 64

by Raeto West — £14.90.

This is a comprehensive reference work and provides the answer to those awkward questions of both beginner and advanced user as well as being an instructive guide to programming.

About one-third of the book is dedicated to BASIC and machine language, whilst other major topics such as graphics, sound, tape storage, etc, are examined in such depth that a whole chapter is devoted to each.

Numerous program listings are included throughout the book. They clarify the well-written text and demonstrate how to use and write programs efficiently on the above topics. A disk containing the programs can be purchased at the same time as the book for only £8.90 or two tapes may be purchased for £9.90.

There is a complete chapter on major peripherals like printers, plotters and modems which provides an excellent introduction with the aid of tables and programs.

The eighteen appendices include many useful tables, charts as well as programming advice on converting programs between the 64, VIC and PETs.

Chapter two 'Getting to know the 64' acquaints the reader with the various features of the 64 and more detail about the control ports is included in chapter 16.

Chapter three 'BASIC reference guide' will be the section most desired by most readers as it explains lucidly such items as Keywords, Syntax and Error messages. Other useful information like relocating BASIC is also found in this section but large topics like ROM and kernal routines, 64 memory map have their own chapters.

Out of all the books written for the 64 this is, to my knowledge, the best and once you have bought it you will never put it down for long. At only £14.90 for about 600 pages packed with information, this must be a bargain. It is available from Biblios Ltd Star Road, Partridge Green, Horsham, W Sussex RH13 8LD and please include a £1 for postage for the book if you are purchasing direct, and an additional 50p for the tapes or disk.

Contact: Biblios Ltd, Star Road, Partridge Green, Horsham, W Sussex RH13 8LD. Tel: 0403 710971 (Enclose £1 postage for the book if you purchase direct and an additional 50p for the tapes or disk).

JG

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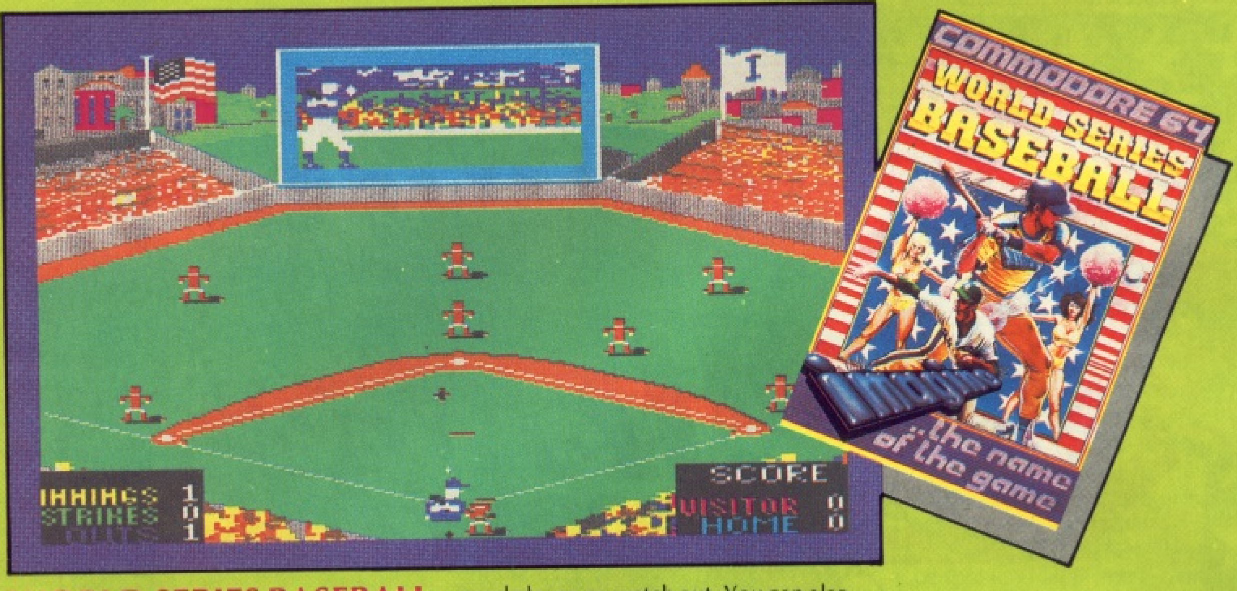


WORLD SERIES BASEBALL

This must be one of the best things to hit computer screens this year!

Never mind if you don't know how to play baseball and don't like sports simulations. This game from Imagine Software is so brilliant, you'll have to admit your addiction before you even begin to play because the demonstration in itself is marvellous fun.

From the time the players dashed onto the playing diamond (baseball for field), the little animated figures captured my interest. Play is a bit difficult to learn since the player takes various roles of the players on his team depending on where the ball is and what needs to be done. Even once you have the routine down, it takes skill and coordination to win.

One or two can play World Series Baseball; if one, the computer takes the role of one team and the computer is a very good player, so watch out. You can also choose the colours your team wears.

The only thing that might pose a problem is the complexity and baseball terminology used in the instructions, some of which is inadequately defined for strangers to the sport. This problem can be overcome with a little practice, however.

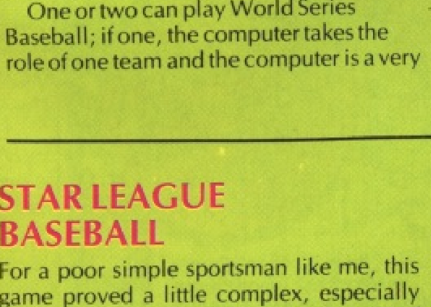
Brilliant is a word one would use often in describing World Series Baseball; graphics, 3D effects, play, realistic action all get top marks from me and can't help but do so from most avid games fans — sports or not.

Fast loader: Yes
Graphics: *****
Sound: ***
Playability: *****
CCI Rating: *****
Price: £7.95 cassette
Company: Imagine Software Ltd, 6 Central Street, Manchester M2 5NS. Tel: 061-832 6633.

STAR LEAGUE BASEBALL

For a poor simple sportsman like me, this game proved a little complex, especially with what seems a fairly lengthy set of instructions.

It seemed merely a matter of luck when I struck the ball, as each pitch varies in height and speed. (The game has a facility to choose different pitchers wiht a variety of throws.) It also seemed difficult to get the batters really running round the bases, while the fielders were quick to the ball.



Not a good game to play with one player, much more effective with two. Imaginatively the designer has added in a "tire" element which gradually affects the ability of the pitcher. Few video or computer games incorporate this, despite the fact that it plays a fundamental part in all physical sport. This kind of adaptation helps to improve realistic effect. The fielders move like the characters in Mr. Benn!

Fast loader: Yes
Graphics: ***
Sound: ***
Playability: **
CCI Rating: ***
Price: £10.99
Company: Activision, 15 Harley House, Marylebone Road, London NW1. Tel: 01-486 7588.

SH

Indoor

The long summer days are here and
games which appear at this time of
year for sports releases so CCI asked
take time off his cricket playing to
joined by

ON COURT TENNIS

A well designed, fairly detailed game with numerous modes to accommodate the novice, up to the experienced player.

A selection of surfaces are available (grass is the best as with clay or hard, the ball bounces up disconcertingly) but whether you choose John Ringler (who has a bad temper) or Jimmy Orr (very tenacious) all players appear bow legged and flat footed. Well, you can't have everything!

Needs some practice to co-ordinate players movements with swing of the racket, and you have to remember to hold the fire button down once a stroke is made otherwise the ball lobs tamely into the net.

I was hoping I might hear Ringler exclaiming "the ball was out", but computerised line-judges don't make mistakes!

Fast loader: Yes
Graphics: ***
Sound: ***
Playability: ***
CCI Rating: ***
Price: £10.99
Company: Activision, 15 Harley House, Marylebone Road, London NW1. Tel: 01-486 7588.

SH

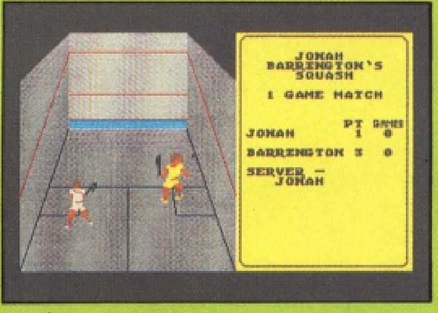
r Sports

nd so are the multitudes of sport-based
of year. This summer has been a bumper
ked Middlesex fast bowler Simon Hughes to
g to try his hand at some other sports. He is
d by Tony Lydeard.

JONAH BARRINGTON'S SQUASH

Of the games I played, this was perhaps the most realistic. Squash is very much a game of angles, speed and stamina – quite mathematical in many ways – so a well presented computer game, as this, should be able to assimilate the real thing.

The graphics provide a lifelike effect, are clearly presented and it is fairly easy to time the backswing with the arrival of the ball. The computer helpfully compensates for any slight inaccuracy of positioning. The speed of the game can be adjusted by using different coloured balls, again like the sport.



```
     JONAH
 BARRINGTON'S
    SQUASH

 1 GAME MATCH

             PT GAMES
JONAH         1   0
BARRINGTON  3   0
SERVER –
   JONAH
```

Player control via the joystick is rather sluggish, but you can vary the angle of stroke to come off one, two or even three walls.

I wouldn't go as far as to say that the players move with the agility of Jonah Barrington, but at least they don't get knee injuries or break their rackets.

Fast loader: Yes
Graphics: ****
Sound: ****
Playability: ****
CCI Rating: ****
Price: £7.95
Company: New Generation Software, The Brooklyns, 15 Sunnybank, Lyncombe Vale, Bath, BA2 4NA. **SH**

KNOCKOUT

While the game doesn't exactly capture the excitement of the real thing, it can be quite fun. You control a boxer whose movements are restricted to moving left, moving right, punching with his left hand, punching with his right hand or blocking his opponents punches. To land a blow, your man has to be in range – it follows that you can also receive one!

Depending on the level of stamina selected, it takes more or fewer blows to result in a knockout. In the single player game, you can decide on the stamina level of both yourself and your opponent. You can also program your opponent's sequence of actions. These facilities make it very easy to become Champion of the World (or very difficult!).

Knockout is one of those "just one more go" games which seem to make the clock go faster. If the boxers had a little more freedom of movement it would be even better.

Fast Loader: Yes
Graphics: ****
Sound: ***
Playability: ****
CCI Rating: ****
Price: £7.95 (cassette)
Company: Alligata Software, 1 Orange Street, Sheffield. Tel: 0742 755796. **TL**

ROCKETBALL

There was once a film with a very similar title which must have inspired this. Apart from the lack of motor bikes, the plot is identical. Teams of roller skaters try to knock seven bells out of each other whilst skating around a track. If they've got time they'll try to hit a magnetic target with a large metal ball.

The animation is good, with realistic leaping, squatting, punching, throwing and falling over. The controls take a while to master so you'll have to practice for a while. One or two can play and the computer opposition is pretty strong (quite strong enough to smash me regularly, anyway). Once you've got the hang of it, you'll want to challenge others. **It wouldn't surprise me if one or two Rocketball Leagues got themselves set up – it's that sort of game.**

Fast Loader: Visi Load
Graphics: ****
Sound: ****
Playability: *****
CCI Rating: *****
Price: £7.95 (cassette)
Company: IJK Software, Unit 3C, Moorfields, Moor Park Ave, Bispham, Blackpool. Tel: 0253 55282. **TL**

INTERNATIONAL TENNIS

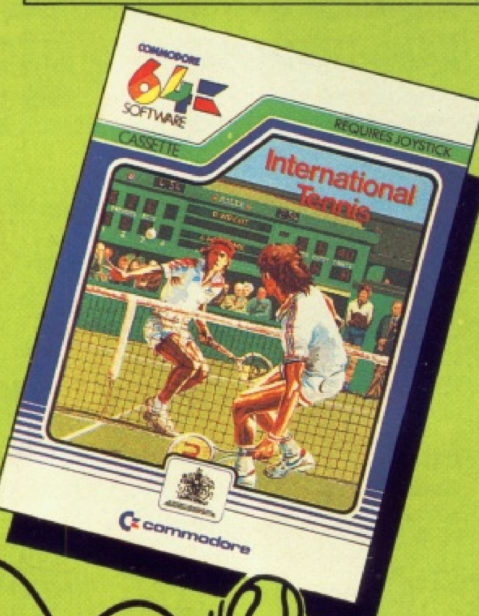
The latest sports offering from Commodore lives up to standards.

Played under standard tennis rules, you control your player via a joystick. A little practise is required to get to grips with required movements.

Graphics are realistic down to the shadow of the player. Behind the court sit the colourful crowd, eyes following the ball.

Take some time to master International Tennis and see if you can become this year's Wimbledon champion.

Fast loader: Yes
Graphics: *****
Sound: ****
Playability: ****
CCI Rating: ****
Price: £5.99
Company: Commodore, 1 Hunters Road, Weldon, Corby, N Hants. Tel: 0536 205555.



SLAPSHOT

As a simulation of ice hockey, Slapshot isn't bad. The figures can skate with the puck, shoot, pass, foul one another or generally mill about. The spectators get excited at the appropriate times and there is a commentator. Unfortunately the commentary is limited to "Chaaaarge!" at face-offs, "He scores!" when a goal is scored and "Penalty!" when an offence is committed, so the novelty of having speech built into the game soon wears off.

The game's major shortcoming is that it can only be played with two joysticks – don't buy it if you only have one! (To be fair, this fact is printed quite clearly on the box.) Having said that, if you've got the necessary equipment and can find a partner then **you can have a lot of fun.**

Fast Loader: Yes **Graphics:** *****
Sound: *** **Playability:** ***
CCI Rating: ***
Price: £8.95 (cassette)
Company: Anirog, 29 West Hill, Dartford, Kent DA1 2EL. Tel: 0322 92513. **TL**

THE WAY OF THE EXPLODING FIST

Competition Karate is reputedly non-violent event. However, playing this Karate simulation brought out many violent reactions in me as I kickedd and chopped!

Exploding Fist really has it all – excellent graphics, realistic sound and addictiveness.

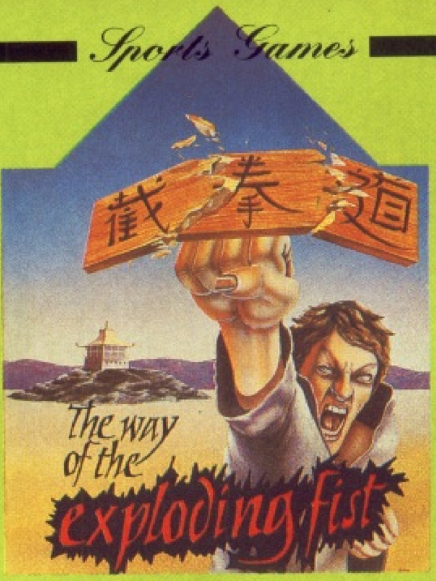
Catchy Eastern music sets the scene as the two opponents bow to each other. From then, the fight begins. Numerous moves can be made via joystick or keyboard. A sensitive joystick is essential.

Movement is very smooth whether you are delivering a flying kick or a jab punch.

The characters fall realistically: sometimes dropping slowly to their knees, arms clutching stomachs and a grimacing expression, other times being lifted off the ground to fall with a thud.

Sounds include realistic slaps and punches and the player's grunts and groans.

Scoring is based on how well you execute your move, with more points awarded for intricate moves such as a roundhouse kick.


截拳道
the way of the exploding fist

You start as a novice and aim to beomce a Tenth Dan – no mean feat. (Should that read mean feet?).

Exploding Fist has that 'just one more go' addictiveness.

Fast loader: Pavloda
Graphics: *****
Sound: ****
Playability: ****
CCI Rating: *****
Price: £9.95
Company: Melbourne House, Castle Yard, Richmond TW10 6TF. Tel: 01-940 6064.

BRIAN JACKS SUPERSTAR CHALLENGE

If you've got the waggling habit from all those decathlon games that have been around and if you watch "Superstars", then this game will be a must for your collection.

Superstar Challenge isn't just a matter of how fast you can waggle, though. A "Powersync" feature means that you have to synchronise your joystick movements to the screen action and build up slowly. And the movements are different for the different sports. Squat thrusts, for example, entail three movements to the left followed by three to the right – failure to complete this sequence properly means that you don't score. Swimming involves breathing (press the fire button . . . but only when the swimmer's mouth is out of the water) as well as a powersync arm action – tricky!

Animation throughout is first-class. Its almost worthwhile loading up the game just to see the little man collapse when you fail to make the right movements in the Arm Dips sequence.

Fast Loader: Yes
Graphics: *****
Sound: *
Playability: ****
CCI Rating: ****
Price: £8.95 (cassette)
Company: Martech, Bay Terrace, Pevensey Bay, East Sussex, BN24 6EE. Tel: 0323 768456.

TL

INTERNATIONAL BASKETBALL

A pretty simple version of a pretty simple sport. Playing one player mode, against the computer, has drawbacks, because it only allows control of one man at a time, and he may not necessarily have the ball. This creates frequent infringements and stoppages.

Nevertheless, it is a lively game with other players constantly on the move off the ball giving the impression of competitiveness and teamwork.

I also learnt a few new rules, and got a good idea of how to violate the three and five second delays!

This game does not incorporate players with different speeds and abilities which would seem more appropriate in basketball than baseball, but it does keep things simple and easy to learn. The winning team is awarded a cup at the end; quite a nice touch. Quite good graphics.

Fast loader: Yes
Graphics: ****
Sound: ***
Playability: ***
CCI Rating: ***
Price: £5.99
Company: Commodore, SoftPost, 1 Hunters Road, Weldon, Corby, Northants NN17 1QX. Tel: 0536 205252.

SH

AQUA RACER

Take one fairly ordinary motor racing simulation game; change the sprite that looks a bit like the back of a car into one that looks a bit like the back of a speedboat; make the road and the grass the same colour but put posts along the verge; alter the "exploding car" sequence into a "sinking boat" sequence and what do you get?

Bubble Bus think that you get an exciting 3D speedboat race. Others might describe it as a fairly ordinary motor racing simulation game with cars that look a bit like boats.

Aqua Racer gives you a choice of 20 different tracks (sorry – courses) and the options of Practice Mode (an empty course to negotiate), Race Mode (other boats in the way) or Demo Mode (one computer-controlled boat drives along for a while before crashing into the back of another).

If you are a fan of ordinary motor racing simulation games then this will be right up your street – or should I say, right up your river. (If you are a Software House that releases games like this, I would probably say "right up your *****")

Fast Loader: Burner
Graphics: ****
Sound: ***
Playability: *
CCI Rating: *
Price: £6.99 (cassette)
Company: Bubble Bus, 87 High Street, Tonbridge, Kent. Tel: 0732 355962.

TL

We couldn't fit in reviews of every newly-released sport game, so there follows a list of other new titles for your reference:

Match Fishing – Alligata
Knockout – Alligata
Graham Gooch's Test Cricket – Audiogenic
Frank Bruno's Boxing – Elite
Tim Love's Cricket – Peaksoft
Nick Faldo's Open – Argus
Hyper Sports – Ocean
Konami's Tennis – Ocean

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NEW GAMES RELEASES

ARCADE

Jet Set Willy II, (£8.95 cassette), for 64 from Software Projects, Bearbrand Complex, Allerton Road, Woolton, Liverpool L25 7SF. Tel: 051-428 7990.

Timeslip, (£6.95 cassette), for C16 and Plus/4 from English Software Company, 1 North Parade, Parsonage Gardens, Manchester M60 1BX. Tel: 061-835 1358.

Jumpman Junior, (£3.99 wafer), by Epyx for 64 with wafer drive, from General Automation, Automation House, 45 Ledgers Road, Slough, Berks SL1 2RQ. Tel: 75 76533.

Ghettoblaster, (£8.95 cassette), for 64 from Virgin Games Ltd, 2-4 Vernon Yard, 119 Portobello Road, London W11 2DX. Tel: 01-727 8070.

The Chess Game, (£7.95 cassette), for 64 from MicroClassic, Greenfields, Priory Road, Forest Row, Sussex RH18 5JD. Tel: 0342 822189.

ADVENTURE

The Antagonists, (£5.95 book with listing, £5.70 optional programmed cassette), text adventure for 64 from Addison-Wesley Publishers Ltd, Finchampstead Road, Wokingham, Berks RG11 2NZ. Tel: 0734 794000.

Jewels of Babylon and **Crystals of Carus,** (£7 cassette), both graphic adventures for 64 from Interceptor Micros, The Green, Tadley, Hants. Tel: 07356 71500.

Ultima III, (£19.95 disk only), illustrated text adventure for 64 from US Gold Ltd, Unit 10, Parkway Industrial Centre, Heneage Street, Birmingham B7 4LY. Tel: 021-359 3020.

The Commodore Plus/4 Adventure Pack, (£14.95 disk only), made up of Colossal Cave, True Spit, Spaced Out and Underground Adventure, for Plus/4 from Duckworth, The Old Piano Factory, 43 Gloucester Crescent, London NW1. Tel: 01-485 3484.

Beatle Quest, (£9.95 cassette, mail order), text adventure for 64 from Number 9 Software, 47 St George's Avenue, West, Wolstanton, Newcastle-under-Lyme. Tel: 0782 624917.

SPORTS

International Tennis and International Basketball, (£5.99 cassette), for 64 from Commodore UK, SoftPost, 1 Hunters Road, Weldon, Corby, Northants NN17 1QX. Tel: 0536 205252.

On-Court Tennis, Star League Baseball, On-Field Football, (£10.99 cassette), sports simulations for 64 from Activision UK, 15 Harley House, Marylebone Road, London NW1. Tel: 01-486 7588.

Nick Faldo's Open, (£9.99 cassette), golf simulation for 64, Argus Press Software, Liberty House, 222 Regent Street, London W1R 7DB. Tel: 01-439 0666.

Hypersports and **Konami's Tennis,** (£7.95 cassette, £12.95 disk), sports simulations for 64 from Ocean Software Ltd, 6 Central Street, Manchester M2 5NS. Tel: 061-832 6633.

Graham Gooch's Test Cricket, (£9.95 cassette), simulation for 64 from Audiogenic Ltd, 39 Suttons Industrial Park, London Road, Reading, Berks RG6 1AZ. Tel: 0734 664646.

Knockout, (£7.95 cassette), boxing simulation for 64 from Alligata Software Ltd, 1 Orange Street, Sheffield S1 4DW. Tel: 0742 755796.

Kikstart, (£1.99 cassette), off-road biking simulation for 64 from Mastertronic Ltd, Park Lorne, 111 Park Road, London NW8 7JL. Tel: 01-402 3316.

Tim Love's Cricket, (£8.95 cassette), for 64 from Peaksoft, 48 Queen Street, Balderton, Newark, Notts NG24 2NS. Tel: 0636 705230.

The Way of The Exploding Fist, (£9.95 cassette), karate simulation for 64 from Melbourne House Ltd, Castle Yard, Richmond TW10 6TF. Tel: 01-940 6064.

MISCELLANEOUS

Frederick Forsyth's The Fourth Protocol, (£12.95 cassette, £15.95 disk), strategy spy game for 64 from Hutchinson Computer Publishing, 17-21 Conway Street, London W1P 6JD. Tel: 01-387 2811.

Mig Alley Ace, (£9.95 cassette, £14.95 disk), fighter plane simulation for 64 from US Gold Ltd, Unit 10, Parkway Industrial Centre, Heneage Street, Birmingham B7 4LY. Tel: 021-359 3020.

Pigeon pie

Joining the sports game craze among computer software companies is Ocean Software with plans to continue a line of games from Japanese software house Konami.

The line follows the success of World Series Baseball, a simulation incorporating a 3D close-up of the batter in the background. The first of the follow-ups, Hypersports, was scheduled for June release. It is a simulation of a series of sports — Skeet (pigeon shooting), Archery, Swimming, Triple Jump, Vault and Weightlifting.

The next is Konami's Tennis in July. Both are £8.95 on cassette for the 64.

Subsequent titles include Yie Ar Kung-fu, Hyper Rally, Konami's Table Tennis and Konami's Golf.

More on the arcade rather than the sports side, Mike is a "classroom farce" set in an American high school and Comic Bakery is complete with flying pies. Both are now on coin machines and will be converted to home computers and ready for November and December releases.

Contact: Ocean Software Ltd, 6 Central Street, Manchester M2 5NS. Tel: 061-832 6633.

The Commodire Kid
by Mag
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Book is key to text adventure

The producers of Secret of Arendarvon Castle have released another book form adventure, their trademark being that they rely on printed words and pictures for clues and the whole story.

The Antagonists involves the player in following the trail of Albert Renshaw as he tries to escape a world now ruled by insects. The clues lie in a diary in which he records his actions and what he sees. Hal Renko and Sam Edwards wrote the adventure and the listing for it is included at the back of the £5.95 book. Publishers Addison-Wesley suggest typing it in in parts.

But if you don't fancy a few days of program entering, the fully pre-programmed cassette is available for an additional £5.70. Nevertheless, the book is required to complete the game.

The book is generously illustrated with detail on animal and plant life in this earth of the future fantasy.

Contact: Addison-Wesley Publishers Ltd, Finchampstead Road, Wokingham, Berks RG11 2NZ. Tel: 0734 794000.

Slip-sliding awayyyyyy

Time is the subject of English Software's first C16-Plus/4 computer game.

The lack thereof is also a key since time is slipping even while you're trying to keep it from slipping. Huh?

Called Timeslip, the title refers to a "time disturbance traced to distant planet" caused by 36 Time Orbs placed within three time zones. The player is to destroy the orbs and synchronize the zones — before time runs out, of course.

Timeslip sells for £6.95 and English claims it contains 60 different screens.

Contact: English Software Company, 1 North Parade, Parsonage Gardens, Manchester M60 1BX. Tel: 061-835 1358.

Complexity earmark of adventure

From the moment you begin to create the characters, Ultima III promises only one thing — it won't be easy.

It is the latest in US Gold's All American Adventures line of games and the company calls it "an epic fantasy." From the description, that is probably quite accurate.

You begin with one to four characters and the player(s) define characteristics of each, eg race, sex, strength, dexterity, intelligence and profession. The last four are allocated according to a total of 50 points spread between the attributes. All this is stored on a "scenario disk."

Once you've decided dwarves, elves, humans, etc, you enter the land of Sosaria, but that still is not the beginning. You first stock up with supplies — mainly weapons — in a town. Finally, you are ready to start.

Considering the obvious complexity and the price of £19.99 (available on disk only), US Gold warn against taking this one lightly and suggest it is only for the serious adventure gamester.

For the slightly lighter-hearted, Mig Alley Ace is a fighter pilot simulation with 3D aerial combat and in US Gold's tradition of such games, this one won't be simple either. Price is £9.95 cassette, £14.95 disk.

Contact: US Gold Ltd, Unit 10, Parkway Industrial Centre, Heneage Street, Birmingham B7 4LY. Tel: 021-359 3020.

Games, watches go to winners

CCI readers showed a phenomenal interest in last month's Airwolf competition sponsored by Elite Systems Ltd with entries pouring in daily up to the deadline and beyond.

All winners were drawn from a box of correct entries which reached our office no later than the stated deadline, Friday, 7th June.

The 10 first prize winners will receive a copy of the 64 version of Airwolf; a quartz movement digital watch embossed with the Airwolf logo, complete with 24 hour alarm and a one-year guarantee from House Martin; and a colour 5′ by 3′ poster.

The winners are K Williams of Brecon, Powys; MJ Davies of Llandeilo, Dyfed; Ivan Boswell of Farlington, Portsmouth; Richard Brown of Fraserburgh, Aberdeenshire; A Roberts of Longhope, Gloucester; S Gosling of London SE1; Donner Wong of Edam, Netherlands; DE Peters of Swindon, Wilts; AP Bartley of Glastonbury, Somerset; and Christopher Russell of Midanbury, Southampton.

Ten second place winners are John Warriner, Keyingham, N Humberside; Sean Hales, Caister-on-Sea, Norfolk; A Wicks, Crowthorne, Berks; D Rawnsley, Scunthorpe, South Humberside; Lee Lester, Bargoed, Mid-Glams; Andrew Crauley, Sinjin, Derbyshire; Nat Crosby, Lightwater, Surrey; LA Talbot, Minden (BFPO); Henrik Kurka, Norway; and Steven Lai of London N15. Each receives a copy of Airwolf for the 64.

A further 10 who came in third get the poster. They are Craig Brown, Walsall; Justin Evans, Wirral, Merseyside; Paul Almy, Portslade, Sussex; Jos Kaats, At Soest, The Netherlands; JG Cherry, Chesterfield, Derbyshire; Adrian Price of Builth Wells, Powys; R Crouch, Wootton, N Hants; Mr PG Talbot, Sittingbourne, Kent; Martin Hooper, Brighton, East Sussex; and J Anderson, London SW17.

AHHHHH!!!
EXIT
!

This month your letters are answered by Rae West. Rae is the author of three large reference books on Commodore computers; the latest is Programming the Commodore 64, following Programming the VIC and Programming the PET?CBM. All are published in the UK by Level Ltd. Rae is also published in the USA by Compute! Books.

* * *

Dear Rae

I have a problem. I want to write a menu program that displays what programs are on disk, and automatically loads one on the user pressing a key or entering the filename.

What I basically need is a routine to load a basic program, either from another basic program or from machine code. Do you know of such a routine?

Steven Squires
Torquay
S. Devon

It's not entirely clear to me what you're after, but I can suggest two approaches:–

1) You could write a menu program, consisting of statements like 100 Print "1. FIRST PROGRAM" with a letter command to process the numbers. For example:

1000 GET x$:IFx$=""GOTO1000

1010 IF x$= "1" then load "FIRST PROGRAM"This sort of thing loads and runs (or 'chains') the target program. There is a problem: the pointers to the end of the program are not reset, so a program longer than the original tends to get corrupted at its top end. (The idea is to allow programs to share variables). The easiest solution is to lengthen the menu program so it's longer than the programs it has to load. This can be slow, though another approach is to poke higher end of program pointers before program LOAD.

2) A more general program can be written by opening a file to $ and reading the directory one character at a time. In this way a directory can be printed to the screen while still being under program control.

(All these points are covered in my book 'Programming the Commodore 64').

Dear Rae

As a regular reader of CCI (and one of the older generation), I would be most grateful if you could explain certain points of Machine Code to me and many others.

Although I understand about Hexadecimal Binary and Decimal, what puzzles me is which type of instruction (LDA $ or LDA#$) goes with which.

I have spent pounds and pounds on books, but cannot grasp the finer points. LDA to me means load the accumulator. But why do we use the HASH# and then why do we sometimes only use the string $. Please give me two examples of their use and explain why. This will help me in my future programming.

Mr SJG Reeves
Birmingham

As you correctly say, LDA does mean 'LOAD THE ACCUMULATOR'. The high symbol allows you to load the accumulator with some fixed value which you choose; LDA without this symbol loads from some address in memory, which could contain any value.

For example, LDA#$41 which is the same as ordinary decimal 65 so LDA#$41 then JSR$FFD2 outputs the letter "A" to the screen, because the ASCII value of 'A' is 65.

LDA without the hash symbol loads from memory, and is typically used to move data in memory or add it from memory. For example, LDA $0400 loads the accumulator with the first character on the screen, whatever this may be.

Dear Rae

I shall probably type in the program "Beam Me Up Scotty", and will be using either my 'Extramon' or 'Dr. Watson' assemblers (the latter using denary values). Although I have no knowledge of the 'PAL' assembler, I have been able to understand such instructions as LDX #›NAMBUF but I am stumped by the details on lines 1800 to 1860 on page 54.

Will you please provide me with the 'Extramon' and 'Dr. Watson' equivalents and, if possible, for my added interest the 'Codemaster' equivalent (D. Lawrence and M. England's book).

Mr J. Galvin
Huddersfield

The meaning is actually very simple: ASC is a command used by some assemblers which puts the contents of a string into memory in ASCII form.

For example, ASC "HELLO" puts five hexadecimal bytes, 48 45 4c 4c 4f, into memory. The listing has a label for each message, eg. MSGNAM — for use by the assembler when printing the message.

If your assembler has no command of this sort, just list the ASCII values you require and poke them into memory, either with BASIC's poke or, if you prefer to use hexadecimal, with the .M command.

Dear Rae

Please could you tell me if there is a compiler program for the VIC-20. I have written a few games in BASIC, but they are much too slow, so a compiler is essential.

Steven Swales
Sunderland

I'm afraid VIC-20 has too little memory to allow a BASIC compiler to work to any degree of sophistication. Compilers are quite complex, and additionally need a lot of memory to store the tables which they have to generate as they run. Typical speed improvements are 4-20 times. It is possible that some compilers, intended for the Commodore 64, might successfully compile VIC programs if they exclusively used 'kernal' routines, but this is a long shot. Compilers are relatively expensive proprietary software products, so you could try this either with a friend who has a 64 and a compiler or through your local ICPUG (Independent Commodore Users Group) contacts.

Dear Rae

I have the following queries to ask:

1. During debugging of my basic program and having run it and altering some line-numbers and saving it back to disk, sometimes I cannot save it to my disk and instead I got an asterisk in the directory. The funny thing is that I cannot scratch it using the Validate command. Can you give me advice how to scratch these files? I think it is because the basic program that I was debugging has a machine language subroutine and I did not erase it before saving the rectified program. Can you give me advice on how to scratch this file?

2. I have a BMC monitor with my C64. When I run a commercial machine language program the screen cannot stand still. It scrolls upwards every 2-3 seconds, whilst if my program is pure basic then the screen is okay. Please can you give advice on how to stop the scrolling screen?

M.A. Sutandar
Indonesia

1) An asterisk in a desk file directory means the file was not correctly closed. This means that some directory data has been written onto the disk, but not all. This situation is tricky — because the pointers between the sections of the program on disk aren't properly stored, you risk losing your later programs through corruption. I'd advise you to load your programs one by one from the disk and save them onto another one, then reformat your disk.

2) There's no reson why machine-language and BASIC programs should behave differently as regards their screen display: The horizontal hold isn't controlled by the 64. (It's true that different 64s — eg US & European — differ between themselves in their signal to the monitor).

I can only suggest you find the 'hold' controls and adjust your set to stop the screen scroll.

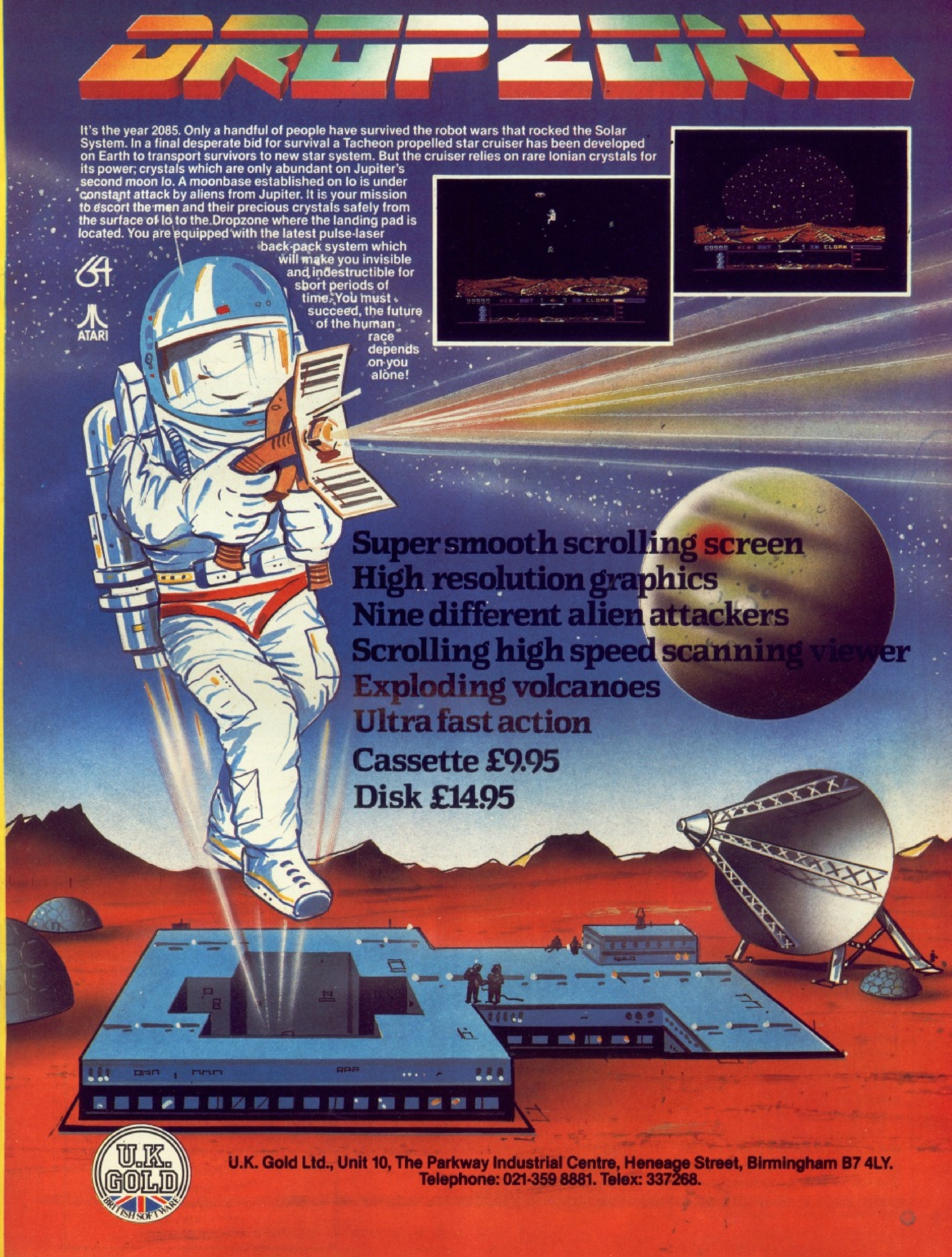
Do you have a computing problem, or advice to offer other readers? Write to us at:

Queries,
Commodore Computing International,
Finsbury Business Centre,
40 Bowling Green Lane,
London EC1R 0NE

Please do not send your SAE's as it is impossible to reply personally to every query.

THE FUTURE OF MANKIND IS IN YOUR HANDS!

DROPZONE



It's the year 2085. Only a handful of people have survived the robot wars that rocked the Solar System. In a final desperate bid for survival a Tacheon propelled star cruiser has been developed on Earth to transport survivors to new star system. But the cruiser relies on rare Ionian crystals for its power; crystals which are only abundant on Jupiter's second moon Io. A moonbase established on Io is under constant attack by aliens from Jupiter. It is your mission to escort the men and their precious crystals safely from the surface of Io to the Dropzone where the landing pad is located. You are equipped with the latest pulse-laser back-pack system which will make you invisible and indestructible for short periods of time. You must succeed, the future of the human race depends on you alone!

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Ultra fast action
Cassette £9.95
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U.K. Gold Ltd., Unit 10, The Parkway Industrial Centre, Heneage Street, Birmingham B7 4LY.
Telephone: 021-359 8881. Telex: 337268.

Games Arena

MASTER OF THE LAMPS

This one gives a space age twist to the old genie legends to make an interesting and upbeat game.

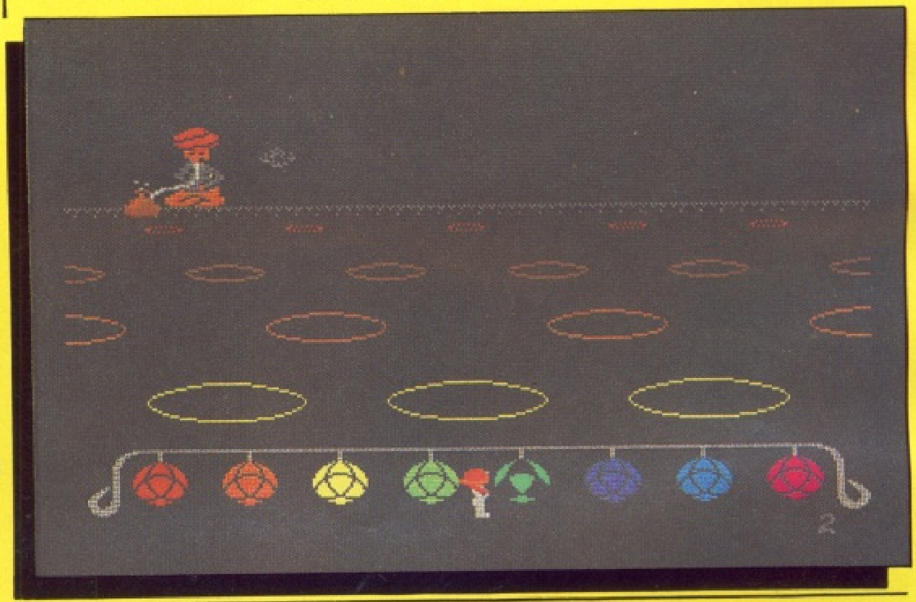
Backgrounded with jazzy Arabic music, the title and intro screens get the game off to a good start and the diamond shapes hurling through space at you make an effective 3D tunnel through which the player flies on his way to the genies' dens. There he experiments with the sound of the various gongs with the goal of matching the sound the genie emits with the sound of one of the gongs. If you're successful, you put together one broken lamp for each den to capture all the escaped genies.

It's a different approach that could almost be considered teaching note-recognition, though on a very simplistic scale. The goal basically stops at that. Granted, it would take a long time to go through 21 dens to repair three lamps, but trying could become tedious halfway through.

If you enjoy playing such musical games and appreciate super graphics and good sound, you could enjoy Master Of The Lamps.

It's three modes give you a chance for a practice run, seven trial runs or the full blown quest for the throne.

Fast loader: Flashload
Graphics: *****
Sound: ****
Playability: **
CCI Rating: ***
Price: £10.99 cassette
Company: Activision UK, 15 Harley House, Marylebone Road, Regent's Park, London NW1 5HE. Tel: 01-486 7588.



QUASIMODO

This is a fast-paced game that takes skill and coordination with the joystick before you even begin.

Standard joystick controls are made more difficult in Quasimodo by eight direction possibilities, complex throwing control and the fact that archers are scaling their way up the wall, presumably multi-handed since they can fire arrows at the same time.

You control the hunchbacked character trying to recover his three precious jewels from a castle but archers are determined to stop him. On the first level, they scale the walls while you hurl cannon balls at them (accompanied by appropriate crashing noises); on the second, you swing from bell to bell avoiding bats and ghosts to recover the next jewel; and on the last level, you scale walls and avoid the guardians of the castle who pop their heads out of the windows at the most awkward moments.

The challenge is healthy — or deadly depending on your agility — from the very beginning. It takes timing and foresight along with a lot of patience to play Quasimodo but the chance to swing on bells is tempting enough to make you work at least toward the second level if not further.

Fast loader: Yes
Graphics: ***
Sound: **
Playability: ***
CCI Rating: ***
Price: £9.95 cassette, £14.95 disk
Company: US Gold Ltd, Unit 10, Parkway Industrial Estate, Heneage Street, Birmingham B7 4LY. Tel: 021-359 3020

STRINGER

Addictive Games seems determined to stick to its line of occupational computer games. Football Manager was a great success, but Stringer falls a bit short of the mark.

In the traditional arcade adventure mould, the player must search for and pick up scattered items to attain the final goal. The character is a "stringer" whose assignment is to get an exclusive photo of a star staying in a hotel penthouse suite. To do so you collect press pass, camera, key, etc.

Despite the fairly original idea, Stringer doesn't present a terribly difficult challenge. The five skill levels vary the approach a bit but not enough to really stump you. It is saved, though, by an option for two players, which adds a good touch.

Character animation is very good with your reporter dressed in his trenchcoat pursued unceasingly by a porter and, at the worst of times, hauled away by the scruff of the neck by a bald, long-john clad hotel guest — Mr Angry!

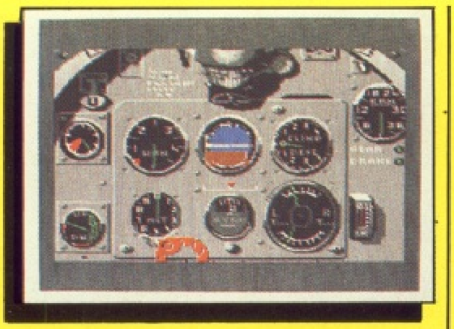
Stringer is a good piece of light entertainment with some jolly music playing in the background. Though it could have gone further and offered more variety, it's low price justifies what is there.

Fast loader: No (loading time 11 mins)
Graphics: ***
Sound: **
Playability: ***
CCI Rating: ****
Price: £6.95 cassette
Company: Addictive Games, 7A Richmond Hill, Bournemouth BH2 6HE. Tel: 0202-296404

All games reviews appearing in this magazine are personal opinions and serve only as a guide to new games on the market. Our star ratings for graphics, sound, playability and the CCI rating are as follows:

*** = Poor**
**** = Average**
***** = Good**
****** = Very Good**
******* = Excellent**

SPITFIRE 40



All the history and drama of fighter aircraft have been wrapped into one excellent package that looks good, sounds good and most of all plays like you've never seen before.

Spitfire 40 is the new flight simulator from Mirrorsoft. It is carefully written throughout in both the game and the all-important instructions. The latter even includes a summary of tips and a drawing of the the computer keyboard indicating relevant keys!

After logging in as one of five pilots of your choice, a couple of flicks of the fire button bring you to the instrument panel, one of the best we've seen. It's done in a realistic grey tone with subtle red and green indicators and shadows to complete the 3D effect.

Functions are controlled by keyboard and joystick with most of the keys corresponding to the operation — B for brakes, F for flaps and so on — unlike other flight simulators that tie you to the manual for hours of painful memorization. The joystick is sensibly used for pitch, turning, rolling, banking and firing.

You flip from the panel to the cockpit view screen with the spacebar — a slightly annoying interruption. The landscape is the standard unadorned horizon but once you find your enemy you don't notice anyway as the action keeps you floundering for control every minute.

A realistic, penetrating hum varies with air speed and is punctuated by firing — or the fatal crash.

Realistic graphics and dramatic sound are just the surface, and underneath, Spitfire 40 lives up to the cover. It's an absolute must for flight simulator buffs but even within reach for those who aren't.

Fast loader: Yes
Graphics: *****
Sound: *****
Playability: *****
CCI Rating: *****
Price: £9.95 cassette
Company: Mirrorsoft, Holborn Circus, London EC1P 1DQ. Tel: 01-822 3947.

THE CAPTIVE

"The Glen of Coloured Corpses" is not a friendly place to get lost and with a realistic though frustrating one life, you may have problems being "The Captive."

Your task is to escape while avoiding the corpses like the plague since even getting close is deadly. Tantalising items that may or may not have something to do with your goal are found all over the place but you can only hold three at a time so it takes thought and practice and lots of wandering to discover the way out.

I usually don't like icon-operated adventures because the delay in choosing your option could mean a difference between life and death, but Mastertronic has included a function in the Captive to halt the meanies while you pick a command like "use item" and then choose one of the three items you're holding. This is even more important as you only have one life.

The plot doesn't sound much, but this manages to be quite an addictive game. The one life is highly frustrating considering the deadly corpses are all over and if you die you go right back to the beginning. There isn't even a game save facility to rescue you.

Nevertheless, The Captive is fun and the four-way scrolling graphics are quite good enough to keep your attention, though it might have been nice to have better sound effects.

Fast loader: Yes
Graphics: ***
Sound: **
Playability: ***
CCI Rating: ***
Price: £1.99 cassette
Company: Mastertronic Ltd, Park Lorne, 111 Park Road, London NW8 7JL. Tel: 01-486 3478.

STRANGELOOP

Crushed, electrocuted, dissolved . . .

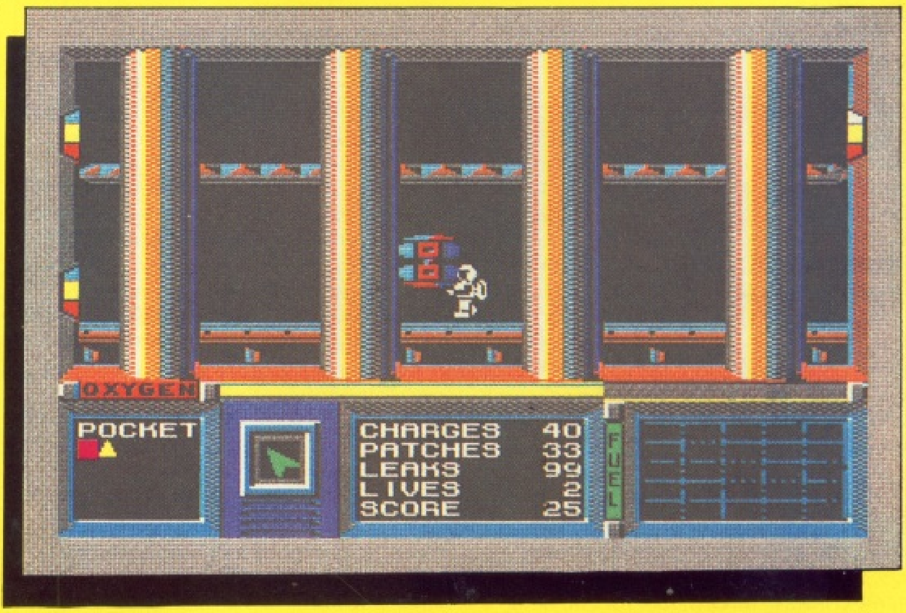
Just a sampling of the joys that await you in the latest offering from Virgin Games, and you only have eight lives at that. Yes, it would seem plenty but each screen genuinely lives up to its boast of unexpected elements. The result is lots of potential for success or failure — you could run out of fuel, get leaks in your space suit or lose your jet cycle, to mention just a few.

So what is this? Strangeloop has you trying to tame a space station of robots who do the earth's dirty work, but have gone mad thanks to a nasty alien. While inside, a gravity force thwarts attempts to controlled movement, so much so that you might find yourself drawn into an electrical current or some other hazard.

Very good graphics contribute to the variety with things floating about in space, some dangerous and some more beneficial to you dead since you get points. The instruments in each room are intriguing and instructions are good, leaving just enough to the imagination to let you discover a few tricks yourself.

One gripe is the slow reaction of the fire button which I found quite infuriating when trying to shoot the elusive 'swarf.'' Sound effects are quite good. **Generally, Strangeloop is bound to bring you back to the computer** particularly with the game save facility to spare undue repetition.

Fast loader: Flashload
Graphics: *****
Sound: ***
Playability: ****
CCI Rating: ****
Price: £8.95 cassette
Company: Virgin Games Ltd, 2-4 Vernon Yard, Portobello Road, London W11 2DX. Tel: 01-727 8070.



EVERYONE'S A WALLY

Being a Wally ain't so bad in this first of a new Mikro-Gen character series, the follow up to which will be released soon, called Herbert's Dummy Run.

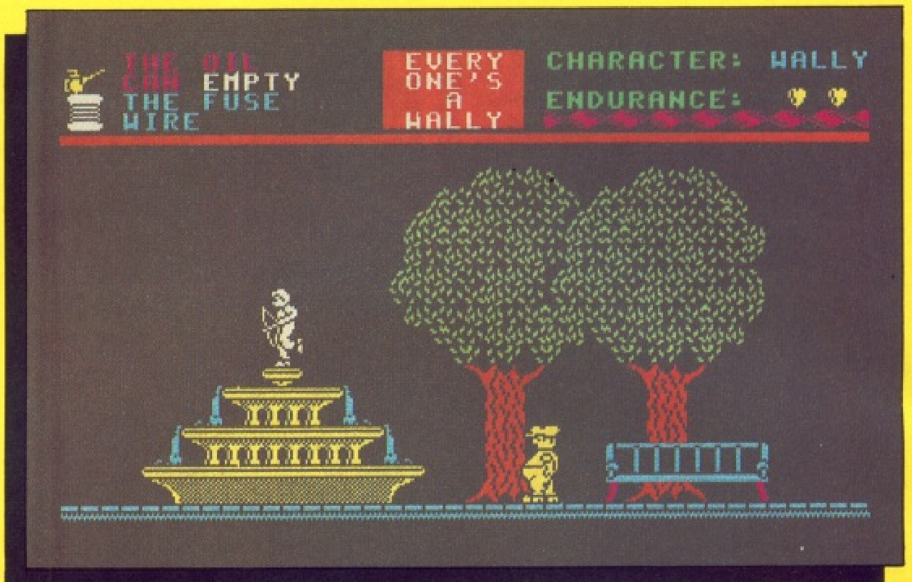
My first impressions of Everyone's A Wally were that the instructions were incomplete and the plot shallow, but I was soon proven wrong. This arcade adventure stars a crew of motley characters called "the Gang" consisting of builder and odd-job-man Wally, his wife Wilma, Herbert the toddler, Tom the Punk, who doubles as a mechanic, Dick the plumber and Harry the Hippie, also an electrician.

Though you begin by controlling Wally, you can shift to any of the other characters when they appear on your screen. Each does his own thing — with the right tools of course — to raise the gang's bank balance. That's all for naught, however, if they don't find the parts of a combination to the bank vault where the money is being held.

It's a very well-thought-out game with plenty to do and plenty to keep you amused. Inevitable confusion nevertheless makes it even more fun, and after several hours of mind-boggling play you could find yourself trying to repair a leaking fountain with a red herring.

Graphics are terrific and detailed and animation is very good, though Tom the Punk looks distinctly like a lizard. Music and sound effects all add to the entertainment, though I question how much of a "hit" the title song was. At the price, the game is a terrific value. Our copy had an error regarding the joystick port to use; the correct one is port 2.)

Fast loader: Yes
Graphics: *****
Sound: ****
Playability: *****
CCI Rating: *****
Price: £9.95 cassette
Company: Midro-Gen, 44 The Broadway, Bracknell, Berks. Tel: 0344-427317.


THE OIL CAN EMPTY
THE FUSE WIRE
EVERY ONE'S A WALLY
CHARACTER: WALLY
ENDURANCE:

ROLAND'S RAT RACE

The expressions on the title screen rats' faces give the first indication of the hilarious fun to be had here and the game comes through.

Roland is, of course, a superstar rat on TV-am. But he got up late in this computer world and his car won't start, so he resorts to his old before-fame-and-fortune methods — the tunnels of London's Underground. Familiar ground perhaps but it's been a long time and the nasties who want to make him late for work have blocked his way in and kidnapped his friends so they can't show him the way out.

There's something hilariously charming about this game, probably the same element that made Roland such a hit in the first place. **He is funny and animated and the goings on will keep you grinning as your hand becomes firmly attached to the joystick.** Roland's Rat Race is very addictive arcade fun, and background music is much more varied than most one-theme games — definitely toe tapping stuff all around.

Fast loader: Yes
Graphics: ****
Sound: ****
Playability: *****
CCI Rating: *****
Price: £7.95 cassette
Company: Ocean Software Ltd, 6 Central Street, Mancester M2 5NS. Tel: 061-832 6633.

THE FOURTH PROTOCOL

Don't let the simplicity of icons fool you. The computer version of Frederick Forsyth's The Fourth Protocol has all the elements – as many as I discovered in any case – of the best selling novel of intrique and politics it is based on. It's espionage, counter-espionage, counter-counter . . . you get the message.

As in the real life spy game, this one requires persistence and patience and lots of desk work. As an MI5 agent, John Preston can access the cencom (presumably central communications) filing system for information or get it from another source somehow. Telling would be . . . well, telling. Your mission is to work against an unknown deadline to defuse a nuclear bomb planted somewhere in the heart of London.

You start with virtually no information – frustratingly realistic – and gather bits and pieces as you go along from menus and with the help of watchers that you assign at will. In fact you must discover for yourself the answers you are looking for in order to carry on with the operation.

The title refers to the final protocol of the 1968 Nuclear Non-Proliferation Treaty signed by the three major world powers – US, Britain and the Soviet Union. The game comes in three parts – investigating NATO documents and gleaning all the information you can; locating the bomb; and defusing it under the pressure of battling SAS and KGB troops all around the building.

The first two units are totally icon-driven, avoiding the frustration of limited vocabulary text adventures. Icons are very clear and when chosen offer good sub-menus and prompts. An occasional delay of several seconds entering a negative command can be tedious, though.

Smart thinking will move you right along with logic being the crucial element. For example, phone numbers are filed, telephones must be answered and just a few sources can yield an amazing lot of info. The further you get the higher your prestige rating and the more resources are allocated to you. The third element is in standard text format and graphics take you right into the explosive action.

Fortunately, CCI got some tips since we had an unfinished copy and we are assured that the few bugs we found would be cleaned up by the time the game is produced en masse. Nevertheless, instructions aren't as specific as they need to be; I found it very difficult to figure out how to get started. For example, I didn't realise that dates must be advanced by the player and don't change automatically as is often the case in "real-time" adventures.

Certainly it is a fascinating concept and the plot is appealing to any spy buff. This is the only Forsyth book to be turned into a computer game and once you get the hang of it can keep you happily spying for hours.

Fast loader: Yes
Graphics: ****
Sound: ***
Playability: ****
CCI Rating: ****
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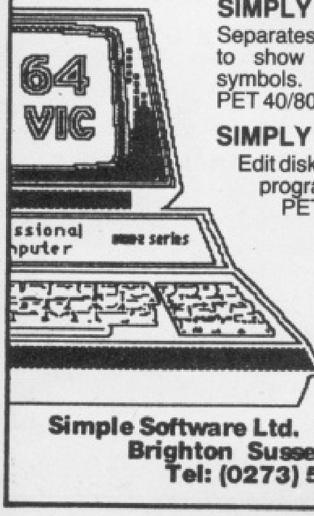

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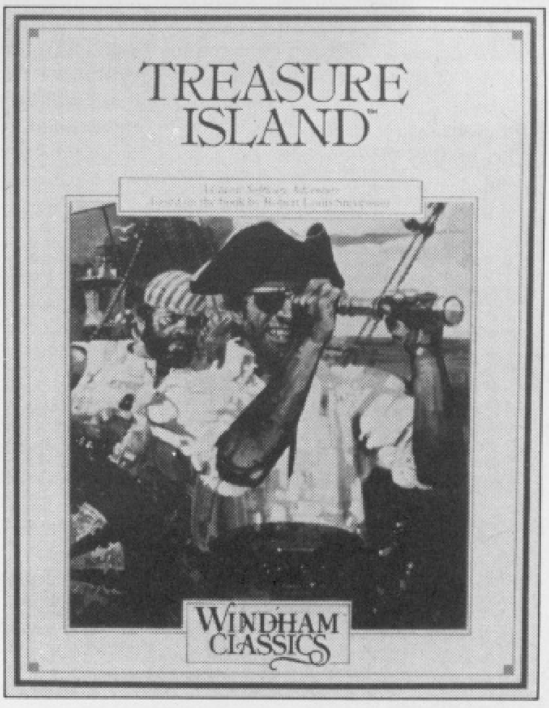
Access

JOHN LONGS FOR IT!



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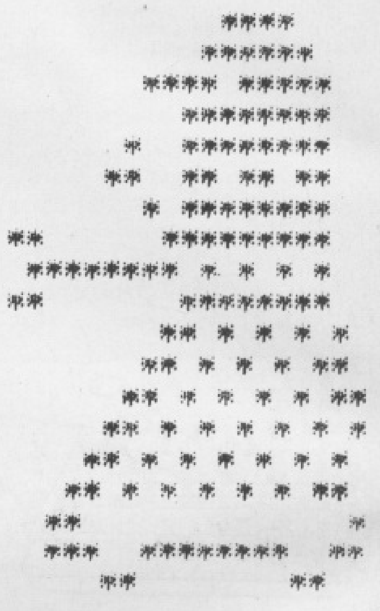
The 'Exterminator' Is Here!

This is the first offering of a new feature for CCI readers interested in SPRITE animation. The SPRITE CORNER will show you ways to create and manipulate an amazing variety of 'lovable little creatures', and lots of potentially 'fiendish little monsters'. We think that you will agree that the sprite design shown on this page undoubtably falls into the second category. It is just one of the images of the animation sequence that has been written into the BASIC KEYBOARD/JOYSTICK routine that is provided for you here by Tony Mangnall and Timi Dabar.



'THE EXTERMINATOR'

Type in the program listing, SAVE it, and then 'run' it with your joystick in PORT 1. The routine is one of the first things that you will need for 'sprite-running'. It will be very useful to you now, and in the issues to follow it will be expanded and changed to demonstrate other sprite 'characters' in animation.

The program listing contains the data for four sprite images. When first 'run', the computer will create from this data, four MIRROR images, thereby using a total of eight sprites but only needing the data for four. The MIRROR technique will make the sprite appear to 'turn and run', rather than just running forwards and backwards. Whilst the data conversion is taking place there will be a short delay, this delay can be avoided in any subsequent 'runs' of the program by making a small addition to LINE 70.

AFTER 1st 'RUN', add :GOTO190 to LINE 70

The DATA has already been MIRRORED and stored in memory during the first 'run', so it is not necessary to do this again. If you make the change and 'RUN' the program, the sprites will appear immediately.

```
1 REM ** THE EXTERMINATOR ** BY TONY MANGNALL/TIMI DABOR (C) JUNE 1985
10 V=53248:X=150:Y=150:DX=3:DY=3:W=256:P1=223:P2=227
20 FORI=0TO7:Q%(I)=W/2:W=Q%(I):NEXT
30 PRINT"Q W E":PRINT"N|/":PRINT"A——D":PRINT"V|\":PRINT"Z X C"
40 PRINT"KEYBOARD SCAN"
50 PRINT"R"
60 PRINT"JOYSTICK IN PORT 1"
70 POKE V+21,1:POKEV+39,7
80 FORI=0 TO 3:FORN=(223+I)*64 TO (223+I)*64+62:READ Q:POKEN,Q:NEXTN,I
90 PRINT"CONVERTING DATA INTO MIRROR IMAGE"
100 PRINT"THERE WILL BE A SHORT DELAY "
110 REM     GET THE SPRITES MIRROR IMAGES
120 FORI=0TO3:FORP=0TO62STEP3:FORT=2TO0STEP-1
130 UI=PEEK((223+I)*64+P+(2-T)):MR=0
140 FORR=0TO7:IFUI<Q%(R)THEN160
150 MR=MR+(128/Q%(R)):UI=UI-Q%(R)
160 NEXTR:POKE(227+I)*64+T+P,MR:NEXT T,P,I
170 PRINT"
180 PRINT"
```

```
190 P=PEEK(197):REM   KEYBOARD SCAN
200 JY=PEEK(56321) AND 15:REM   JOYSTICK SCAN  ( PORT 1 )
210 IF JY=10 OR P=62THEN X=X-DX:Y=Y-DY:Q=1:REM  UP LEFT
220 IF JY=14 OR P=9THEN Y=Y-DY:REM              UP
230 IF JY= 6 OR P=14THEN X=X+DX:Y=Y-DY:Q=2:REM  UP RIGHT
240 IF JY=11 OR P=10THEN X=X-DX:Q=1:REM         LEFT
250 IF JY= 7 OR P=18THEN X=X+DX:Q=2:REM         RIGHT
260 IF JY= 9 OR P=12THEN X=X-DX:Y=Y+DY:Q=1:REM  DOWN LEFT
270 IF JY=13 OR P=23THEN Y=Y+DY:REM             DOWN
280 IF JY= 5 OR P=20THEN X=X+DX:Y=Y+DY:Q=2:REM  DOWN RIGHT
290 IF Q=1 THEN320
300 POKE 2040,P2:P2=P2+1:IF P2=231THEN P2=227
310 GOTO 330
320 POKE 2040,P1:P1=P1+1:IF P1=227 THEN P1=223
330 POKE V+1,Y
340 IF Y<52 THEN Y=52
350 IF Y>220 THEN Y=220
360 IF X<22 THEN X=22
370 IF X>320 THEN X=320
380 HX=INT(X/256):LX=X-HX*256
390 POKE V+0,LX:POKEV+16,HX
400 OF=0:FORI=1TO50:NEXT:GOTO 190
410 REM      DATA
420 DATA 0,7,128,0,15,192,0,115,224,0,31,224
430 DATA 0,31,224,0,11,64,48,31,224,15,255,224
440 DATA 48,58,160,0,223,224,3,58,176,1,117,80
450 DATA 0,234,168,1,213,88,3,170,176,6,0,16
460 DATA 13,85,88,14,127,152,1,128,96,0,0,0,0,0,0
470 DATA 0,7,128,0,15,192,0,115,224,0,31,224
480 DATA 0,31,224,0,11,64,3,31,224,0,255,224
490 DATA 3,42,160,0,95,224,3,181,80,1,106,176
500 DATA 0,213,88,1,170,168,3,85,80,6,0,16
510 DATA 13,85,88,14,127,152,1,128,96,0,0,0,0,0,0
520 DATA 0,7,128,0,15,192,0,115,224,0,31,224
530 DATA 0,31,224,1,159,224,32,111,224,16,63,224
540 DATA 31,234,160,16,31,224,32,63,240,0,117,80
550 DATA 0,234,184,1,213,88,3,170,176,7,85,80
560 DATA 12,0,8,14,127,152,1,128,96,0,0,0,0,0,0
570 DATA 0,4,128,0,15,192,0,27,96,0,31,224
580 DATA 3,31,224,0,140,192,0,95,224,3,63,224
590 DATA 0,234,160,3,31,224,0,53,80,0,106,176
600 DATA 0,213,88,1,170,168,3,85,80,6,170,176
610 DATA 12,0,8,14,127,152,1,128,96,0,0,0,0,0,0

READY.
```

CCI

If you have come across any useful hints and tips, why not share your knowledge with other CCI readers?

Or maybe you have written a program, either in Basic or Machine Code, that you feel is worthy of publication.

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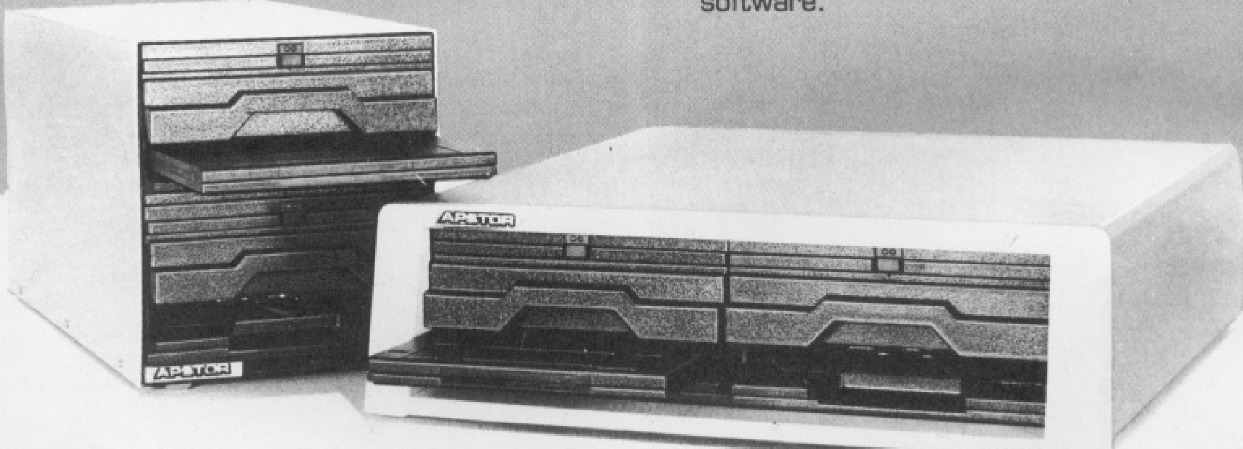

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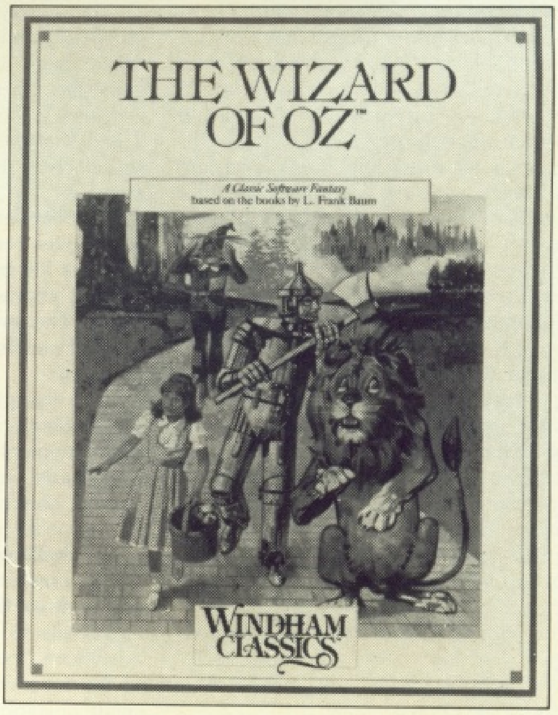
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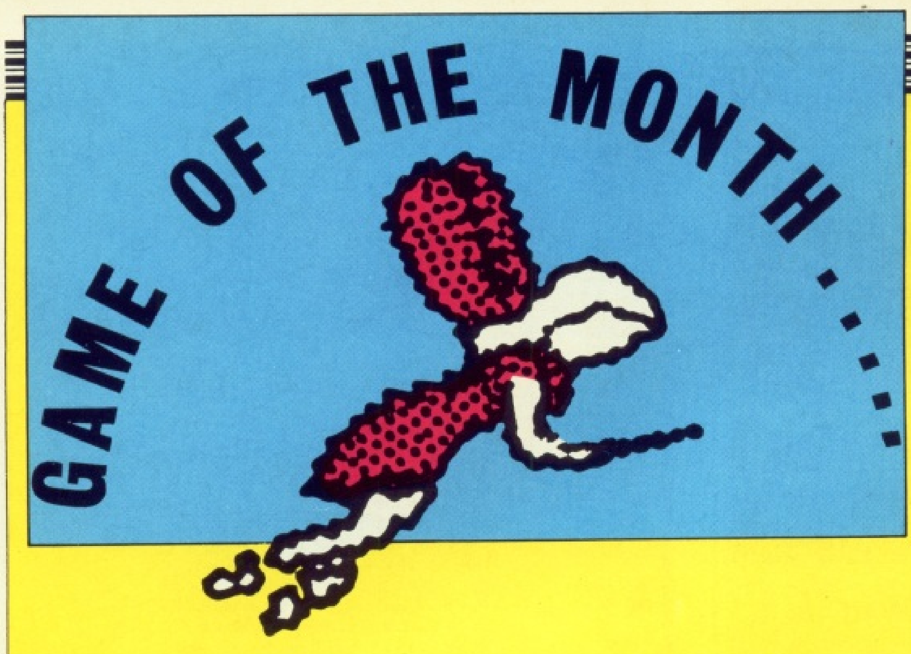


Members of the CCI Readers Panel expressed some strong feelings on Elidon from Orpheus, but they weren't at all the same

It could be nicknamed 'The Great Divide' for our readers panel was divided greatly with very little wavering in their views of Elidon; they either loved it or hated it.

But that may not be totally unexpected since the topic is a Faerie and her wanderings through a lovely forest in search of various items. It is a risk to put such a game on the male-dominated computer market but the risk may pay off since those who are enchanted will recommend this arcade adventure wholeheartedly.

"You control, by joystick or keyboard, a sweet little Faerie, who must travel through the Forest and collect seven bottled potions," explains Mrs Elizabeth O'Brien, 34, of Cheshire. "These she must take back to the Seven Flowers of Finvarra, which are woven into a Garland at the start location. This is no easy task for our very delicate little Faerie, who begins the adventure with four lives and an indicator of her magical power level."

Chris Pemberton, 14, of Netherton in Merseyside, says, "No doubt many of you will be thinking, 'What's a powder puff game like this doing on a macho computer like the 64. But seriously, there's more to Elidon that meets the eye."

As usual there are the many things to avoid, which in this case will sap the Faerie's strength and hinder her chances of success. The player can protect the Faerie by gathering certain items, but only three items are allowed to be carried at any one time so you take chances in which items work against which evils.

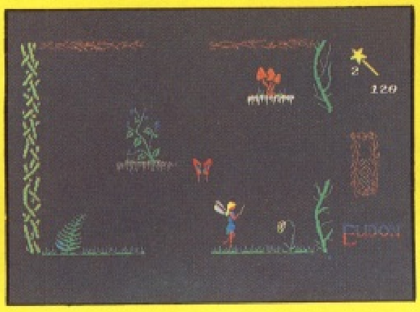
Of that, R J Penfold, 28, of Southampton says, "I feel this is where you either like or hate the game. You are set loose on the forest without the faintest idea what you are looking for, what to touch and what not to touch and even how you will live."

He was among the latter group. "There is a certain sense of challenge but nothing much to test your mind or even your reflexes."

Your patience could be tested, however, as several of our panel found themselves playing for hours and having covered just a fraction of the game.

"I was surprised when I finally expired having explored some 50 plus locations yet being told that I had only visited 16 percent of the rooms, and worse still hadn't even found any of the seven potions I was looking for," Kevin Exley, 28, of Leeds. "There is obviously more to this game than meets the eye."

Heard that somewhere before?



"This game has been described as an arcde adventure, but it is much more than that," says an enchanted 17-year-old gamester, David Cooper of Northwich in Cheshire.

So what more is there? Graphics and sound certainly get good marks from the panel.

"The Faerie is a very 'pretty' character and moves very smoothly," says Cooper. "In fact it's probably the most smoothly moving character I've ever seen in any game. The graphics overall are nothing short of excellent, each of the 300 locations different."

Exley thought otherwise. "The graphics are modest with a black background that one or two colourful flowers and butterflies can't quite brighten up. However, the joystick control is excellent, especially the fire button for hover."

The challenge also is nothing to sneeze at. "If you crash into a wall, the Faerie may fall and go down through ten or more locations as she falls, so it is very easy to get lost in this adventure," comments Mrs O'Brien. "Most of the locations are the same too with a slight deviation of the floral graphics, so making a map of the adventure is difficult and slow, but the pause feature does help a bit."

There Exley did agree when he said, "I found myself warming to this game because it isn't a sudden death; you can survive for quite a while. The trouble is putting that time to effective use."

Thirteen-year-old Martin Younger of Bramhall in Cheshire says, "The graphics in the game are very good and the sound is quite good, but it can become monotonous."

For Pemberton, "there is just not enough action to keep us hardened arcade freaks going. To those who like arcade adventures, however, Elidon will no doubt be the best thing since sliced bread."

CONCLUSIONS

"I must say that it is **an absorbing challenge**, worth buying if you're seeking a change from shooting or jumping games as it is tranquil, elegant and different" – Exley.

"A very good game, with **just the right amount of difficulty** so that you don't get fed up of playing and lots of things are there to keep you busy" – O'Brien.

"Overall I found the graphics and presentation good, very pretty, however it **didn't hold much appeal to me**" – Penfold.

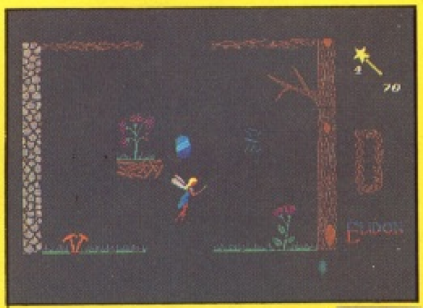
"This game is **a definite winner**" – Younger.

"If you like fast, frantic games with lots of sweaty encounters, **steer clear**" – Pemberton.

"This must be **the game of the year**!! Full Marks!" – Cooper.

Now are you confused?!

Contact: Orpheus, The Smithy, Unit 1, Church Farm, Hatley St. George, Nr. Sandy, Beds SG19 3HP. Tel: 0767-51481.



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On-Field Football gives you the opportunity to use the same strategies used in the game. An endless variety of play possibilities are open to you.

Competition

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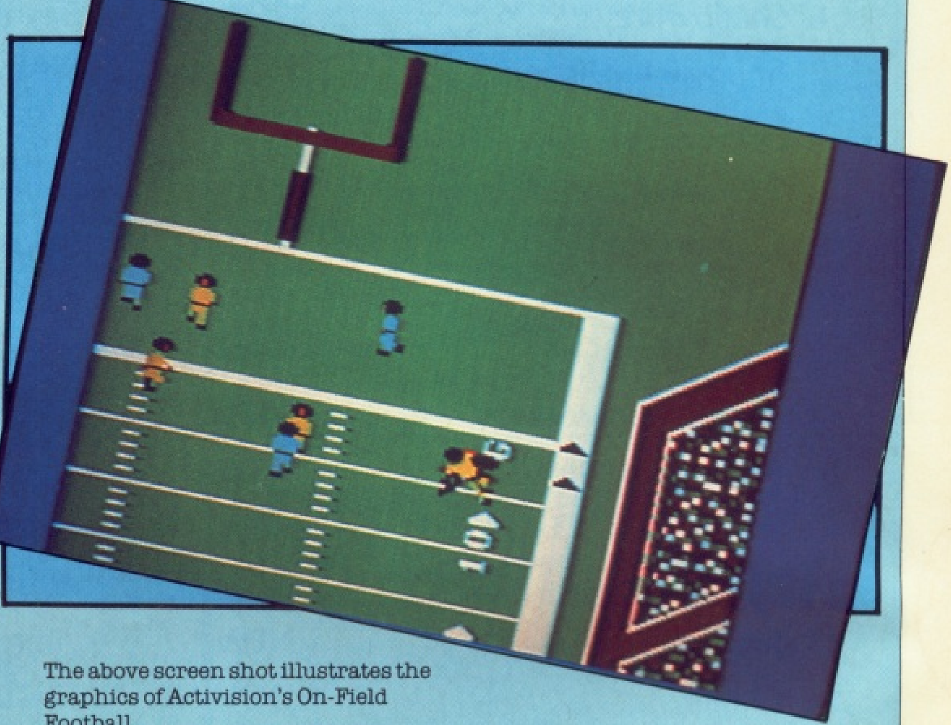
Our resident American Football fanatic has provided us with four questions based on this action-packed sport. Answer them all correctly and you could win not only On-Field Football, but On-Court Tennis, Star League Baseball and Decathlon as well!



The above screen shot illustrates the graphics of Activision's On-Field Football

1 Which team does Dan Marino play for?

____

2 How many players from a team are on the field at any one time?

____

3 What is the maximum number of chances a team gets to advance 10 yards?

____

4 Who won the 19th Superbowl?

____

Your name:______________________________

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All entries must be in our office by 7 August 1985. Our 10 winners will be the first 10 correct entries pulled out of the competition sack. Entries should be sent to:

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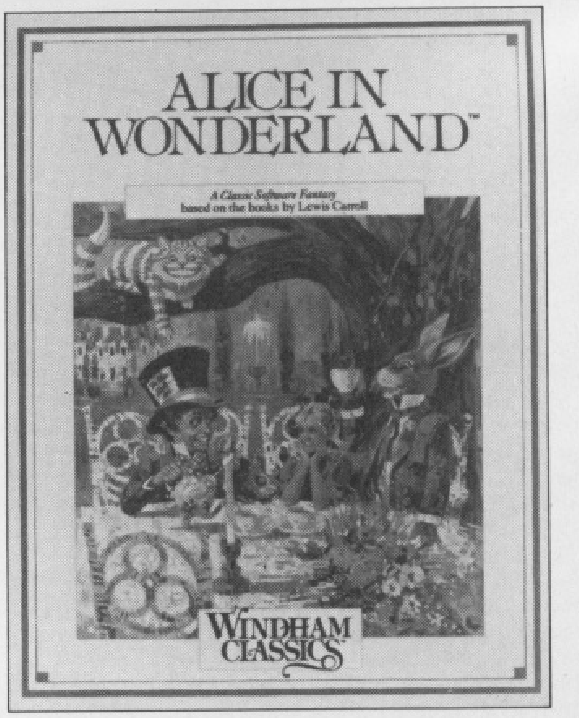
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Going Forth With Your Micro

Forth is an unusual and exciting language. It has been used to control radio telescopes, to run the intensive-care unit for a hospital, and to write arcade games. Yet because it is so compact, it is now available for most home micros. Paul Kail looks at the basic features of the language.

One of the most unusual features of Forth is the way that applications are structured. If you have used BASIC, you will be used to the idea of writing programs. A BASIC program consists of a series of lines, each of which is numbered, and each of which contains a series of commands: when you type RUN and press ENTER, the computer goes through each line of the program in turn, carrying out these commands.

Forth is not like that. There is no word 'RUN' in Forth (nor any equivalent): indeed, there is actually no such thing as a program. Instead of writing a program, you build up applications by creating new word definitions. The new words that you create become part of the Forth vocabulary, and can be used to form yet more words. This process continues until there is one word which performs the job of the whole application. To show how simple this is, we shall define a new word MESSAGE, which prints out the word "HELLO!". This would work just like the one-line BASIC program:

```
10 PRINT "HELLO!"
```

We define the new word like this:

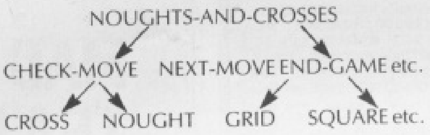
```
:              (This starts the definition)
MESSAGE        (This is the name of our new
               word)
."HELLO!"      (The Forth word." means
               'print the following string')
;              (This ends the definition)
```

You would type this in as just

```
: MESSAGE ."HELLO";
```

If you have a version of Forth for your computer, type this in, and press ENTER. From now on (until you switch the machine off) each time you type in the word MESSAGE, it will print out "HELLO".

Before looking at any more actual code, let's consider another example to show how word definitions can be used in practice. Suppose, for instance, that we wanted to write an application which played a game such as noughts and crosses. To begin with, we would define words which drew the grid and the pieces. We might also need a word which decided which player should start, and another to decide whether a move was valid or not, and so on. Each of these sub-units would be put together to form larger, more complex units, until, finally, we had one which included the whole of the application. The name of each word would give an indication of what it did: for example, we might call the word which produced the crosses CROSS, and the one which checked each move CHECK-MOVE. These words would be combined in a heirarchy something like this:



The stack

The second unusual feature of Forth is the way it handles numbers. In most other computer languages, numbers are processed by creating variables. For example, if we wanted to add two numbers together in BASIC we would have to allocate names to them — such as A and B — and then give some name to the result. We might have a line something like this:

```
20 LET C = A + B : PRINT C
```

It is also possible to use variables in Forth: however, for most purposes, we use the stack instead. This is an area of memory which stores a set of numbers (usually temporarily) while they are being used in a calculation. The stack works on the basis of first-in last-out: to put a number onto it, you simply type the number in and press ENTER. If you put another number in, the first one moves down by one place. For example, suppose we wanted to put the number 3 onto the stack: we would simply type in

```
3 ENTER
```

If we now typed in another number, eg,

```
5 ENTER
```

3 would move down to second position, and the stack would look like this:

```
›5‹
›3‹
```

The word '.' prints out the top number on the stack. So if we now type

```
. ENTER
```

we get

```
5 OK
```

(the top number). 5 is now lost from the stack and 3 is at the top. If so if we use '.' again we get 3:

```
›5‹  .  ›3‹
›3‹  →   →
```

Another way of looking at the stack is to think of it as being like a pile of boxes, with a spring at the bottom. Each box contains one number. When a new number is put on top, the others all move down by one place. When the top number is removed, the numbers beneath each move up by one.

Now that we have introduced the stack, let's look at some of the things that we can do with it. Most Forth words take the numbers they work on off the stack. For example, the Forth word '+' takes two numbers off the stack and adds them together, leaving the result on the top of the stack. So, if we wanted to add the numbers 12 and 4, we would say

```
12 4 + ENTER
```

We might print this result out, using '.', or alternatively we might want to keep it on the stack to use in some other calculation.

As well as the word '+', Forth contains other arithmetic operators such as '—', '*' and '/'. Each of these performs the appropriate arithmetic function on the two numbers at the top of the stack.

Because the position of numbers on the stack is so important, there is a large number of Forth words which move these numbers around. For example, the word SWAP reverses the positions of the top two numbers. Suppose these were 4 and 5, and we wanted to swap these round. We can demonstrate what happens using a stack diagram:

```
›5‹   SWAP   ›4‹
›4‹    →     ›5‹
```

Another word which is very useful in stack manipulations is DUP. This simply duplicates the top number on the stack:

```
›4‹   DUP   ›4‹
      →     ›4‹
```

Sometimes, however, we may want to put a copy of the second number onto the top of the stack. One way to do this is with the word OVER:

```
›9‹   OVER   ›1‹
›1‹   →      ›9‹
             ›1‹
```

Another word which manipulates the top numbers on the stack is ROT, which rotates the top three numbers. For example, if the top numbers were 2, 4 and 5, ROT would change this to 4, 5 and 2 (with 2 now on top):

```
›5‹          ›2‹
›4‹   ROT    ›5‹
›2‹   →      ›4‹
```

To make more complicated stack manipulators we can combine two or more of these words together in the same definition. For example, here is a word which duplicates the top two numbers on the stack:

```
: 2DUP OVER OVER ;
```

(Notice that DUP DUP would not have the same effect as this).

Variables

Although most numbers in Forth are manipulated using the stack, it is also possible to store them as variables, although the way this is done is slightly more complicated than in BASIC. Whereas in BASIC it is not really necessary to know how numbers are stored, this is actually quite important in Forth.

Let's suppose, for example, that we want to have a variable X which gives the price of a certain computer. This variable might take the values 900, 400, 100, 50 etc. as the price of the machine fell. In BASIC we would simply say:

```
LET X = 900
```

then, when we wanted to change it to the new value,

```
LET X = 400
```

and so on. If, at any time we wanted to know the price of the computer, we could say

```
PRINT X
```

In Forth we first have to initialize the variable, like this:

```
VARIABLE X
```

This puts the initial value of X at 0 (In some versions of the language you can give it some other initial value). If we now want to make X equal to 900, we say:

```
900 X !
```

To change X to 400, we say

```
400 X !
```

and so on. (The word '!' is pronounced 'store'). To recall the value of X at any one time, we say

```
X @ .
```

('@' is pronounced 'fetch').

To understand all this we need to consider how a number is stored in memory. There are two stages to this: firstly, we need to have a way of sorting a number and recalling it later; and secondly, we need to know where this number has actually gone. The process is rather like allocating people to the rooms in a hotel. We need some way of moving a person into or out of a given room; and we also need a list of rooms, so we know where to look for people.

The first of these functions is performed by the words 'store' and 'fetch'. 'Store' ('!') takes two numbers off the stack and stores the second of these in the address given by the top number. The word 'fetch' ('@') takes an address off the stack and returns the value of the number stored there.

The second function — remembering where numbers are actually stored — is carried out by the variables themselves. When we ENTER X we get the address where this variable is stored. (We could do without variable names completely, but then we would also have the problem of finding a free area of memory ourselves, and we would have to remember where this was). Thus, in the statement

```
900 X !
```

X leaves an address on the stack, and '!' takes this number, and the 900 itself, and stores it in this address.

The advantages of Forth

If you are used to writing programs in BASIC, you may feel that there is not much point learning a completely new language. However, Forth has a number of very important advantages.

Firstly, it is very fast. This is largely because of the way applications are compiled (Forth is known as a Threaded Interpretive Language). A good version of Forth should run at 10 times the speed of BASIC.

Secondly, Forth is very compact. This is particularly important on home micros, where memory space is at a premium.

Thirdly, because of the way that Forth applications are built up, they are usually much better structured than the BASIC equivalents. They are also easier to debug, because each sub-unit of the application can be independently tested before it is put together with the rest of the application. In BASIC, on the other hand, although it is possible to separate the different parts of a long program from each other, they cannot be separated completely. BASIC programs can easily grow a bit at a time without any real planning.

A fourth advantage of using word definitions as the basic structure of the language is that this is how we think about things in real life. In the 'real world' problems are not usually tackled by dividing them up into a large number of very small sequential steps. Instead, we are more likely to break a large problem down into smaller sections, each of which is coherent in its own right. (For example, in a large organization, these sub-units might be handled by different people within the group). Forth therefore works in a way which is more familiar to us, and for that reason is probably easier to use.

The fifth advantage of Forth is that it is very extendable. Each time you define a new word, you are creating a new part of the language. By contrast, while it is quite possible to write subroutines in BASIC and use these in other programs, they will never be completely independent from the rest of the code. If you want to create new BASIC words, you have to use Machine Code.

How does Forth work?

To explain how Forth works in detail would take many articles just by itself. However, it will be worth looking at this very briefly.

To understand Forth better, we need to look at other types of computer language. The one that you are most likely to have used is BASIC. In this language, when a word is ENTERed, the computer has to look through all the words in its dictionary until it finds the Machine Code subroutine corresponding to that word. When a program is RUN, it still has to make this search, and it has to do so each time that word crops up. It has to do all the work of understanding the program each time it is run; and because of this, BASIC programs are very slow.

Some computer languages, such as Fortran, work in a very different way; and consequently RUN very much faster. Fortran is known as a 'compiled' language: this means that a program is converted entirely into Machine Code before it is RUN. Programs RUN very much faster than if they were written in BASIC; however, the language is also less convenient to use, because the whole program must be recompiled each time you make a correction.

Forth works in a different way from either of these. What essentially happens when a new Forth word is defined is that the computer stores a series of addresses, which correspond to the words which make up the new definition, and which point to the places in memory where these other words are defined. When this new word is used, it can go straight to the addresses where these words are stored, without having to search for them again.

All this explains why Forth is so fast: most of the work of converting Forth definitions into Machine Code is done before the word is actually executed. It also explains why Forth is so convenient to use: although the code that you type in is semi-compiled, compilation takes place at the level of individual words. This means that, unlike in a true compiled language, you do not need to recompile the whole program each time you want to change something.

Conclusion

In this article, we have only been able to scratch the surface. If you have a version of Forth for your micro, you should now sit down and try out some of the ideas that we have discussed. When you decide to get onto something more ambitious, try reading one of these books:

(1) GO FORTH – AN INTRODUCTION TO FORTH P.A.C. Kail (Microbooks, 1985)

(2) THINKING FORTH – Brodie (Prentice Hall, 1984).

CCI

Creative Design

The C16 features impressive graphical high-res commands, but in use restricts the user to a couple of kilobytes. Peter Gerrard teaches you how to overcome these restrictions by designing your own characters.

Every character that the C16 is capable of displaying is built up on an 8 by 8 matrix, just like most other home computers. For example, the letter 'A' looks like this:

```
ABCDEFGH
...**...
..****..
.**..**.
.******.
.**..**.
.**..**.
.**..**.
........
```

There are some 256 characters in all stored away somewhere in the C16's memory (we'll find out where later), and these are the characters displayed in the tables at the back of your manual.

One quick and easy way to see what they all are is to type in and run the following program.

```
10 COLOR 0,8,7:COLOR 4,10,4:PRINT
"[CLR,BLK]"
20 FOR1=OT0255
30 POKE3072+I,I
40 NEXT
50 FORI=1TO500:NEXTI
60 PRINTCHR$(14)
70 FORI=1TO500:NEXTI
80 PRINTCHR$(142):GOTO50
```

Line 10 gives us a brown border and a yellow background, while clearing the screen and setting the printing colour to black. Then, all 256 characters are POKEd onto the screen (screen memory begins at location 3072), before a short delay in line 50 allows you to look at them. The command in line 60 switches the display to lower case mode, followed by another delay and back to upper case mode again. The program will loop round forever, so press the RUN/STOP key to get out of it.

You could, if you want, try printing the CHR$(values of everything, but as lines 60 and 80 in the short program above tell us, some of them have rather interesting effects and do not just display characters on the screen.

Some of these characters — obviously the graphical ones will figure most prominently — can be used to build up fascinating displays, and with the impressive graphical high-resolution commands available on the C16 you might think that there's more than enough in the machine to keep everyone happy. However, when using high-resolution the C16's memory is restricted to a paltry couple of kilobytes — hardly enough for any serious work! Similarly, when designing a graphical display, you will always find that a particular character you want is not available directly from the keyboard. So, what to do?

User Defined Graphics

The obvious thing is to design your own characters. This has the happy results of a) not using up too much memory, and b) allowing you to create virtually any type of display on the screen.

In order to do this, however, we need to know a little bit more about the inner workings of the C16. We'll also come across one or two design faults as well!

The first thing we need to find out is what tells the C16 that when you press the 'A' key a letter 'A' will indeed appear on the screen. Somewhere in the C16's memory must be stored the data for each and every character that it is capable of displaying, and a little hunting around reveals that this 'somewhere' is memory locations 53248 to 55295. Two thousand and forty eight bytes of memory, eight for each of the two hundred and fifty six characters available.

Unfortunately, this information is stored in ROM, not RAM, which means that we can't directly alter it. Okay then, copy it all into RAM where we can alter it!

The following program would appear to do the trick.

```
FORI=OT02048:POKE14336+I,
    PEEK(53248+I):NEXT
```

Being BASIC, this takes quite some time to run. When we've got the character data in RAM we need to tell the C16 that it has now got to find it's information on each character at somewhere other than it's usual position. So, we alter the two memory locations that inform the C16 that a) it's character data is stored in RAM, not ROM, and b) precisely where it is now stored.

These two locations are respectively 65298 and 65299, so we must:

```
POKE 65298,192:POKE 65299,56
```

The first command simply switches a bit of location 65298 off, and the second tells the C16 to look for its character data beginning at the memory location (56*256), or 14336, which is where we put it with the FOR . . . NEXT loop described above.

Type in those two POKEs, and . . . disaster! Some very strange characters appear on the screen, and, to make matters worse, whatever you type comes up as garbage. So, very carefully (since you can't see what you're typing), type out the following, and press RETURN.

```
POKE 65298,196:POKE 65299,208
```

If you've done that correctly, we've got our existing character set back again and the C16 thinks everything is back to normal. So, why didn't all that work?

The answer lies in the PEEK command used to look at locations 53248 and upwards. For some bizarre reason best known to Commodore, PEEK will not recognise any location behind 16384, so what we typed in earlier simply won't work properly. Everything may look all right, but as the strange display found earlier will testify, it isn't.

There are a number of ways to get around this. One is to enter the monitor and transfer a block of memory with the command:

```
T D000 D7FF 3800
```

which performs precisely the same action as the FOR . . . NEXT loop earlier, but this time it works properly. However, that is not a very elegant solution, since you can't ask everyone who wants to use one of your programs with user defined characters in it to enter the monitor and fiddle about with possibly unfamiliar commands.

An easier way is found in the 'Character Designer' listing at the end of the article, so we'll turn our attention to that.

How characters are built up

Although we'll look at the listing in a bit more detail in a minute, what it basically does is to move the top of Basic memory and put the information for the first 64 characters into the space created. This information is read in from the mass of data statements at the end of the listing (lines 30000 onwards). The problem now is, how did we get that information in the first place?

Recall our old friend the letter 'A'.

```
ABCDEFGH
...**...
..****..
.**..**.
.******.
.**..**.
.**..**.
.**..**.
........
```

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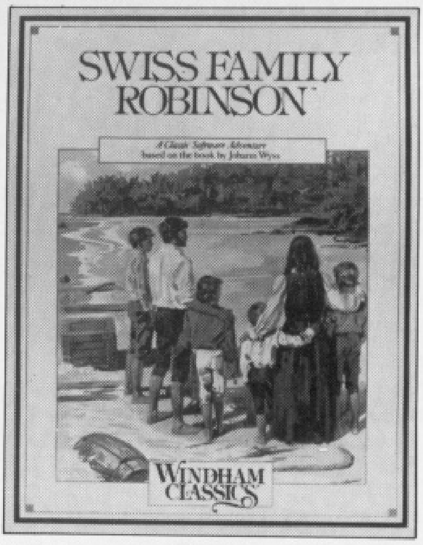
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Each row of dots and asterisks represents one byte of memory, with in this case the letters A to H representing each of the eight bits in that byte. By looking at the diagram, we can see that bits A,B,C,F,G and H are off in the first row of data, and bits D and E are turned on. Incidentally, reverse field characters are created by turning on all the bits that were off, and vice versa.

As you probably know, the maximum number that can be stored in any memory location is 255, which gives us a possible 256 (0 to 255) values that can be put there. In order to make every one of those 256 values unique, a numbering system is used to denote whether any bit in that byte is on or off. If bit A of a byte were on, and all the rest were off, the value 128 would be stored in whatever memory location we're talking about. If bit B were on and all the rest were off then 64 would be stored there, and so on until we get to the last bit, bit H, which has a value of 1 if it's turned on and the rest are turned off.

Going back to the diagram, we see that our first row of data has bits D and E turned on, so our data value becomes 16 plus 8, or 24. If you look at program line 30001 you'll see that that is the first value stored there. Follow it through and see how the rest of the values are worked out.

Program listing

The program as a whole allows you to design your own characters, and place the data for that character in a data statement. If you decide to alter the letter 'A', then the new data will simply replace the old lot, and line 30001 will be re-written. Thus, when you've finished altering your characters, you can use the DELETE command to remove lines 40 to 3004, and leave the data and the lines that read that data in as a nucleus for whatever program you're working on.

The area up to line 50 we've already covered, but what about after that?

Line 59 sets up a couple of variables to decide where the 'cursor' is in terms of screen and colour memory. Don't worry about the XX variable yet. Line 60 then prints up the first 64 characters on the screen in a convenient 8 by 8 square, and line 61 tells us where on the square our 'cursor' is in terms of X and Y co-ordinates.

The initial program menu is then displayed, and the program sits back and waits for you to do something. Pressing 'Q' will exit you from the program, which would be a bit un-wise to do, since we haven't altered any characters yet. Pressing 'E' will allow us to edit whatever character the 'cursor' is lying over, while pressing any of the four cursor movement keys moves our 'cursor' around until you select whatever character you want to edit. The character flashes periodically to remind you of where you are on the square.

Lines 70 to 76 control movement of our 'cursor', while line 78 controls the flashing of whatever character you happen to be lying over.

To take line 76 as an example, don't type

```
C16 CHARACTER DESIGNER


5 POKE52,55:POKE56,55
10 REM UDG PROGRAM
20 COLOR 0,8,7:COLOR 4,10,4:PRINT"[CLR,BLK]CHARACT
ER BUILDER ... PLEASE WAIT
25 FORI=0TO511:READA:POKE14336+I,A:NEXT
30 POKE65298,192:POKE65299,56
40 PRINT"[CD]CHARACTER SET NOW READ IN.
45 PRINT"[CD]PRESS ANY KEY FOR MENU."
50 GETKEYA$
55 PRINT"[CLR]CHARACTER BUILDER"
59 XC=3152:CC=2128:XX=2
60 FORI=1TO8:FORJ=0TO7:POKEXC+I*40+J,J+8*(I-1):POK
ECC+I*40+I,1:NEXTJ,I
61 X1=40:Y1=0
62 X=12:PRINT"[HOME,3CD]"TAB(X)"[RVS]E[OFF]DIT CHA
RACTER
64 PRINTTAB(X)"[CD,RVS]Q[OFF]UIT PROGRAM
65 PRINTTAB(X)"[CD]USE CURSOR KEYS TO":PRINTTAB(X)
"SELECT CHARACTER.
66 GETA$:IFA$="Q"THEN999
68 IFA$="E"THEN100
70 IFA$="[CU]"THENPOKECC+X1+Y1,0:X1=X1-40:IFX1<40T
HENX1=320
72 IFA$="[CD]"THENPOKECC+X1+Y1,0:X1=X1+40:IFX1>320
THENX1=40
74 IFA$="[CR]"THENPOKECC+X1+Y1,0:Y1=Y1+1:IFY1=8THE
NY1=0
76 IFA$="[CL]"THENPOKECC+X1+Y1,0:Y1=Y1-1:IFY1=-1TH
ENY1=7
78 XX=PEEK(XC+X1+Y1):POKEXC+X1+Y1,32:POKEXC+X1+Y1,
XX:GOTO66
100 PRINT"[CLR]CHARACTER BUILDER[2CD]"
102 A=(X1/40-1)*8+Y1:A1=14336+A*8:Z=A
104 FORI=0TO7:FORJ=7TO0STEP-1
106 IFPEEK(A1+I)AND2^JTHENPRINT"*";:ELSEPRINT".";
110 NEXTJ:PRINT:NEXTI
112 PRINT"[HOME,3CD]TAB(X)"[RVS]+[OFF] TO ADD DOT
114 PRINTTAB(X)"[RVS]-[OFF] TO ERASE DOT
116 PRINTTAB(X)"[RVS]M[OFF]IRROR CHARACTER
118 PRINTTAB(X)"[RVS]I[OFF]NVERT CHARACTER
120 PRINTTAB(X)"[RVS]R[OFF]OTATE CHARACTER
122 PRINTTAB(X)"[RVS]E[OFF]NTER CHAR. INTO MEMORY
124 PRINTTAB(X)"[RVS]B[OFF]ASIC DATA STATEMENT
126 PRINTTAB(X)"[RVS]Q[OFF]UIT TO MAIN MENU
127 PRINTTAB(X)"[CD]USE CURSOR KEYS TO":PRINTTAB(X
)"MOVE AROUND."
128 K$="+-MIREBQ[CU,CD,CL,CR]":X1=40:Y1=0
130 XX=PEEK(XC+X1+Y1):POKEXC+X1+Y1,32:POKEXC+X1+Y1
,XX
131 GETA$:IFA$=""THEN130
132 FORI=1TOLEN(K$):IFMID$(K$,I,1)=A$THEN135
134 NEXT:GOTO130
135 XX=PEEK(XC+X1+Y1):POKEXC+X1+Y1,32:POKEXC+X1+Y1
,XX
136 ONIGOTO200,300,400,500,600,700,800,900,1000,11
00,1200,1300
199 GOTO199
200 POKEXC+X1+Y1,42:GOTO1302
300 POKEXC+X1+Y1,46:GOTO1302
400 GOSUB2000
402 FORI=0TO7:FORJ=7TO0STEP-1
404 IFA%(I,J)=1THENPOKEXC+40+I*40+(7-J),42:ELSE PO
KEXC+40+I*40+(7-J),46
406 NEXTJ,I
408 GOTO128
500 GOSUB2000
502 FORI=0TO7:FORJ=0TO7
504 IFA%(I,J)=0THENA%(I,J)=1:ELSE A%(I,J)=0
506 NEXTJ,I
508 GOSUB3000:GOTO128
600 GOSUB2000
602 FORI=0TO7:FORJ=0TO7
604 IFPEEK(XC+40+I*40+J)=42THENA%(7-J,7-I)=1:ELSE
```

in the symbols '[CL]'. These are just used because the printer used to list the program can't cope with the Commodore character set. You press the cursor left key instead, when it comes to typing the program in.

When you decide to edit a character, lines 100 to 127 print up the secondary program menu, as well as displaying a scaled-up picture of the character on an 8 by 8 grid. Line 102 tells the program which character you've selected to edit, and the variable A1 is used to point to the correct location in memory that stores the data for that character. The next three lines build up the large image of the character, and the little Chinaman's hat symbol in line 106 (after AND2) is meant to be the up-arrow key above the 0. Another printer quirk.

Lines 128 to 135 then sit and wait for you to press a key, as well as checking that the key you've pressed is a valid one from the menu selection, before going off to the 12 sub-sections of the program. We'll look at each of those in turn.

Moving the 'cursor' around

Again, our 'cursor' is moved around by using the ordinary cursor control keys, and lines 1000 to 1302 handle that. As usual, a check is made to see that you don't manage to move the 'cursor' off the grid.

Quitting from this section is quite straightforward. The program goes to line 900, which just sends you back to line 55 again. We could have gone straight to line 55 I suppose, but for some long-forgotten reason the program happens to work this way round.

Amending the character is another straightforward process. Line 200 puts an asterisk wherever the 'cursor' happens to be, and line 300 puts a dot there instead. Thus we determine whether a bit is to be turned on (asterisk) or off (dot).

The three most interesting parts of this section of the program are those that a) create a mirror image of the character, b) invert it and c) rotate it.

Character manipulation

To create a mirror image we go to line 400, which first of all buzzes off to the subroutine commencing at line 2000. This builds up an image of the character in the array A% (I,J) in terms of ones and zeroes, rather than the screen image of dots and asterisks. It's easier to manipulate. Integer arrays (using A% instead of just A) are used instead of ordinary ones because they operate faster and take up less memory: a valuable virtue on the C16.

Using our array data, lines 402 to 406 then determine whether an asterisk or a dot is to be displayed on the screen. Note the fact that we're counting down in the J loop, which is what helps to give us our mirror image.

To invert the character is fairly simple, remembering that a reverse image of a character just turns on all the bits that are off, and vice versa. Lines 500 to 508 do the trick for us, with a quick trip to the

```
A%(7-J,7-I)=0
606 NEXTJ,I
608 FORI=0TO7:FORJ=7TO0STEP-1
610 IFA%(I,J)=1THENPOKEXC+I*40+40+(7-J),42:ELSE PO
KEXC+40+I*40+(7-J),46
612 NEXTJ,I:GOTO128
700 FORI=0TO7:FORJ=7TO0STEP-1
702 A=PEEK(XC+40+I*40+(7-J)):IFA=42THENB=B+2^J
704 NEXTJ
706 POKEA1+I,B:B=0:NEXTI
708 GOTO128
800 FORI=0TO7:FORJ=7TO0STEP-1
802 A=PEEK(XC+40+I*40+(7-J)):IFA=42THENB=B+2^J
804 NEXTJ
806 POKEA1+I,B:Z(I)=B:B=0:NEXTI
808 PRINT"[CLR,2CD]"30000+Z"DATA";:FORI=0TO6:Z$(I)
=RIGHT$("00"+MID$(STR$(Z(I)),2),3)
809 PRINTZ$(I);",";:NEXT:Z$(7)=RIGHT$("00"+MID$(ST
R$(Z(I)),2),3):PRINTZ$(7)
810 PRINT"GOTO55[HOME]";
812 POKE1319,13:POKE1320,13:POKE239,2:END
900 GOTO55
999 POKE65298,196:POKE65299,208:PRINT"[CLR]":END
1000 POKECC+X1+Y1,0:X1=X1-40:IFX1<40THENX1=320
1001 GOTO1302
1100 POKECC+X1+Y1,0:X1=X1+40:IFX1>320THENX1=40
1101 GOTO1302
1200 POKECC+X1+Y1,0:Y1=Y1-1:IFY1<0THENY1=7
1201 GOTO1302
1300 POKECC+X1+Y1,0:Y1=Y1+1:IFY1>7THENY1=0
1302 POKECC+X1+Y1,14:GOTO130
2000 FORI=0TO7:FORJ=0TO7
2002 IFPEEK(XC+40+I*40+J)=42THENA%(I,J)=1:ELSE A%(
I,J)=0
2004 NEXTJ,I
2006 RETURN
3000 FORI=0TO7:FORJ=0TO7
3002 IFA%(I,J)=1THENPOKEXC+40+I*40+J,42:ELSE POKEX
C+40+I*40+J,46
3004 NEXTJ,I:RETURN
30000 DATA60,102,110,110,96,98,60,0
30001 DATA024,060,102,126,102,102,102,000
30002 DATA124,102,102,124,102,102,124,0
30003 DATA60,102,96,96,96,102,60,0
30004 DATA120,108,102,102,102,108,120,0
30005 DATA126,96,96,120,96,96,126,0
30006 DATA126,96,96,120,96,96,96,0
30007 DATA60,102,96,110,102,102,60,0
30008 DATA102,102,102,126,102,102,102,0
30009 DATA60,24,24,24,24,24,60,0
30010 DATA30,12,12,12,12,108,56,0
30011 DATA102,108,120,112,120,108,102,0
30012 DATA96,96,96,96,96,96,126,0
30013 DATA99,119,127,107,99,99,99,0
30014 DATA102,118,126,126,110,102,102,0
30015 DATA60,102,102,102,102,102,60,0
30016 DATA124,102,102,124,96,96,96,0
30017 DATA60,102,102,102,102,60,14,0
30018 DATA124,102,102,124,120,108,102,0
30019 DATA60,102,96,60,6,102,60,0
30020 DATA126,24,24,24,24,24,24,0
30021 DATA102,102,102,102,102,102,60,0
30022 DATA102,102,102,102,102,60,24,0
30023 DATA99,99,99,107,127,119,99,0
30024 DATA102,102,60,24,60,102,102,0
30025 DATA102,102,102,60,24,24,24,0
30026 DATA126,6,12,24,48,96,126,0
30027 DATA60,48,48,48,48,48,60,0
30028 DATA12,18,48,124,48,98,252,0
30029 DATA60,12,12,12,12,12,60,0
30030 DATA0,24,60,126,24,24,24,24
30031 DATA0,16,48,127,127,48,16,0
30032 DATA0,0,0,0,0,0,0,0
30033 DATA24,24,24,24,0,0,24,0
30034 DATA102,102,102,0,0,0,0,0
30035 DATA102,102,255,102,255,102,102,0
```

subroutine starting at line 3000 to display the new character on the screen.

However, rotating the character is not so easy, and hence the routine starting at line 600 is a little longer than the previous two. After visiting the subroutine at line 2000 we move our character data round line by line, and then display it up on the screen again. By rotating the character three more times, we get back to where we started from, just to prove that it works properly.

And into memory

To enter the character in memory is simply a question of POKEing the relevant data into the correct part of memory. Lines 700 to 708 do this, and this part of the program is repeated in lines 800 to 806 when we actually create the data statement for the new character. Again, beware of the Chinaman's hat in lines 702 and 802. Press the up-arrow key above the 'O' instead.

Getting the data statement to appear on screen and become a part of the program is a bit complicated, and lines 808 to 812 achieve the desired results. By carefully printing everything on the screen, and adding a GOTO55 for good measure, we can get what we want with line 812. Locations 1319 and 1320 are the first two locations in the C16's keyboard buffer, and location 239 tells the C16 how many characters are stored in the buffer. It's a way of getting the machine to type two carriage returns, instead of you having to do it.

```
30036 DATA24,62,96,60,6,124,24,0
30037 DATA98,102,12,24,48,102,70,0
30038 DATA60,102,60,56,103,102,63,0
30039 DATA6,12,24,0,0,0,0,0
30040 DATA12,24,48,48,48,24,12,0
30041 DATA48,24,12,12,12,24,48,0
30042 DATA0,102,60,255,60,102,0,0
30043 DATA0,24,24,126,24,24,0,0
30044 DATA0,0,0,0,0,24,24,48
30045 DATA0,0,0,126,0,0,0,0
30046 DATA0,0,0,0,0,24,24,0
30047 DATA0,3,6,12,24,48,96,0
30048 DATA60,102,110,118,102,102,60,0
30049 DATA24,24,56,24,24,24,126,0
30050 DATA60,102,6,12,48,96,126,0
30051 DATA60,102,6,28,6,102,60,0
30052 DATA6,14,30,102,127,6,6,0
30053 DATA126,96,124,6,6,102,60,0
30054 DATA60,102,96,124,102,102,60,0
30055 DATA126,102,12,24,24,24,24,0
30056 DATA60,102,102,60,102,102,60,0
30057 DATA60,102,102,62,6,102,60,0
30058 DATA0,0,24,0,0,24,0,0
30059 DATA0,0,24,0,0,24,24,48
30060 DATA14,24,48,96,48,24,14,0
30061 DATA0,0,126,0,126,0,0,0
30062 DATA112,24,12,6,12,24,112,0
30063 DATA60,102,6,12,24,0,24,0
READY.
```

Conclusion

To get the best results out of this program, it's best just to play around with it. Take any character, and see the effect of rotating, inverting, and creating a mirror image of it. Design your own characters for use in your own programs, and let the computer worry about bits and bytes, data statements and memory.

To use the data in your own programs, all you'll need are lines 5, 25 and 30, plus (of course!) the data itself. If you can then, from within the program itself, delete lines 30000 onwards you'll have about ten thousand bytes left in the machine, enough for quite a convincing program. How do you delete lines from within a program? Study the techniques used to generate the data statements, and that should point you gently towards the answer.

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Pointer Sorts

Avoid garbage collections when sorting strings with advice from Mike Hart on the two popular sorts, Exchange and Shell.

All sorting methods work by comparing elements of an array and at some stage effecting a 'swap' in successive passes through the data so that eventually the whole of the array is sorted. In the cases of strings, however, a lot of redundant strings can be left behind to accumulate in memory and, on the CBM machines in particular, this can give rise to the dreaded 'garbage collect' times when the machine might go dead for minutes at a time.

Under such circumstances, it is a good idea to keep strings where they actually are in an array but to alter the 'pointers' to those strings in a subsidiary array. Hence it is the actual strings that are compared but the *pointers* that are swapped. No garbage collection problems occur in this case and your original array is left intact which might be useful for certain circumstances. In this article, I will show how this can be done with two sorts in common use: the Exchange sort and the Shell sort.

```
POINTER  SORTS

10 REM ****    POINTER SORTS     ****
20 :
30 REM  ***   BY  M. C. HART     ***
40 :
50 N=10:DIM A$(N,4),P(N),A(N),B(N):J=RND(-1)
60 :
70 DEF FNR(X)=INT(X*1000+0.5)/1000
80 FOR J=1 TO N:A(J)=INT(RND(1)*101):PRINT J,A(J):B(J)=A(J):P(J)=J:NEXT:PRINT
90 :
100 REM
110 REM EXCHANGE -FL.POINT 1D ARRAY
120 REM
130 :
140 TI$="000000"
150 FOR I=1 TO N-1:S=A(I):X=I:FOR J=I+1 TO N:IF A(J)<S THEN S=A(J):X=J
160 NEXT:A(X)=A(I):A(I)=S:NEXT
170 T1=TI/60
180 FORJ=1 TO N:PRINT J,A(J):NEXT:PRINT
190 PRINT"EXCHANGE FL.POINT ID ARRAY"FNR(T1)"SECS":PRINT
200 GET A$:IF A$=""THEN 200
210 :
220 FOR J=1 TO N:A(J)=B(J):PRINT J,A(J):NEXT:PRINT
230 :
300 REM
310 REM EXCHANGE -FL. POINT+POINTERS
320 REM
330 :
340 TI$="000000"
350 FORI=1 TO N-1:S=A(P(I)):X=I:FOR J=I+1TO N:IFA(P(J))<STHENS=A(P(J)):X=J
360 NEXT:T=P(X):P(X)=P(I):P(I)=T:NEXT
370 T2=TI/60
380 FOR J=1 TO N:PRINTJ,A(P(J)):NEXT:PRINT
390 PRINT"EXCHANGE-FL.POINT+POINTERS"FNR(T2)"SECS"
400 PRINT
410 GET A$:IF A$=""THEN410
500 REM
510 REM SET UP STRINGS
520 REM
530 PRINT:PRINT"NOW SETTING UP DEMO STRINGS..."
540 FORJ=1 TO 254:S$=S$+CHR$(65+RND(1)*26):NEXT:PRINT:J=RND(-1)
550 FOR J=1 TO N:FOR K=1TO4:A$(J,K)=MID$(S$,RND(1)*240+1,6):PRINT A$(J,K)"    ":
560 NEXT K:PRINT:NEXT J:PRINT
570 :
```

```
580 INPUT"SORT ON WHICH FIELD (1-4)";F
590 IF F<1 OR F>4 THEN 580
600 REM
610 REM EXCHANGE-2D STRING+POINTERS
620 REM
630 :
640 TI$="000000"
650 FOR I=1 TO N-1:X$=A$(P(I),F):X=I
660 FOR J=I+1 TO N:IF A$(P(J),F)<X$ THEN X$=A$(P(J),F):X=J
670 NEXT:T=P(X):P(X)=P(I):P(I)=T:NEXT
680 T3=TI/60
690 PRINT:FOR J=1 TO N:FOR K=1 TO 4:PRINT A$(P(J),K)"    ";:NEXT K:PRINT:NEXT J
700 PRINT:PRINT"EXCHANGE 2D STRING POINTERS"FNR(T3)"SECS":PRINT
710 GET A$:IF A$=""THEN 710
```

The Exchange sort

This sort really deserves more prominence than it has received in some of the standard works because it has several virtues. It is very easy to program and really quite efficient for items of data less than about 30 or so.

In the demonstration program provided, you can see that the whole sort is contained in only two (compound) lines (150 . . . 160). The outer 'I' loop goes from the first element to the last but one element, whilst the inner 'J' loop goes from the value of the I element plus one to the end. The 'J' loop finds the smallest element in the array and feeds it into S. Then the smallest element is fed into position I and the whole process is repeated until the I loop is completed. Notice that the version published here (the HART-EXCHANGE sort?) is actually faster than many of the published versions of the exchange sort for the following reason. Normally one would expect a sorting algorithm to zero a flag before comparisons are made and to set a flag to indicate that a swap needs to be made. In this version, because the number of swaps is comparatively low, a swap is made on every pass of the outer loop. By making swaps 'unconditional' one then saves the processing time associated with setting and unsetting a 'swap' flag and testing to see if a swap should be implemented or not.

Whilst this may offend some of the purists, it seems to perform a faster sort by effecting unconditional swaps and can therefore be justified on these grounds if not grounds of elegance!

My experiments with sorts of variables in single arrays indicates that this unconditional swap version runs in 80% of the time that a 'conditional swap' version would take. The same experiments also show that the HART-EXCHANGE sort of a floating point variable in a single array will outperform any other sort, including QUICKSORT, in arrays of less than about 36. So for small sorts, the HART-EXCHANGE sort is undoubtedly one of the most efficient sorts available — though I say so myself!

Adding Pointers

In this version of the sort (lines 350-360) the elements of the array to be sorted (A(. .)) are 'pointed to' by the array P(. .). This has been initialised in line 80 from 1 . . N. At the end of the 'inner loop' then the position of the smallest element will be held in the variable X. Notice in the exchange that follows in line 360 that it is the elements of the *pointer array* that are exchanged, leaving the original array intact.

This sort takes longer than a conventional sort in which the elements of a sort array are exchanged as at each stage the interpreter is using an index to the locations of the sort array and this has to be looked up or calculated. It does however generate benefits later on, as we shall see.

A two-dimensional string sort . . with Pointers

```
YDAYWP    YLZNEU    IBTNQY    JFWTBM
LEPEDX    EDXUON    QTLBJO    QNTTHL
NWFMSB    NAXCQF    QJFWTB    TTHLMH
BJOIQJ    DLKHJY    HZSJVE    QCPVCR
JFWTBM    YOLGAT    QJFWTB    TLBJOI
YEKIYS    QFXNWC    BOFWKV    LMHUNG
JGKRDL    ECDQNA    HJYLZN    GKRDLK
TTHLMH    TNQYEK    WTBMCL    VNJLST
JIQQHA    GNFYRE    HAMQWG    CLGTSU
ENDYQL    CPVCRZ    PEDXUO    VTEQCP

SORT ON WHICH FIELD (1-4) 1

BJOIQJ    DLKHJY    HZSJVE    QCPVCR
ENDYQL    CPVCRZ    PEDXUO    VTEQCP
JFWTBM    YOLGAT    QJFWTB    TLBJOI
JGKRDL    ECDQNA    HJYLZN    GKRDLK
JIQQHA    GNFYRE    HAMQWG    CLGTSU
LEPEDX    EDXUON    QTLBJO    QNTTHL
NWFMSB    NAXCQF    QJFWTB    TTHLMH
TTHLMH    TNQYEK    WTBMCL    VNJLST
YDAYWP    YLZNEU    IBTNQY    JFWTBM
YEKIYS    QFXNWC    BOFWKV    LMHUNG

EXCHANGE 2D STRING+POINTERS .933 SECS
```

```
YDAYWP    YLZNEU    IBTNQY    JFWTBM
LEPEDX    EDXUON    QTLBJO    QNTTHL
NWFMSB    NAXCQF    QJFWTB    TTHLMH
BJOIQJ    DLKHJY    HZSJVE    QCPVCR
JFWTBM    YOLGAT    QJFWTB    TLBJOI
YEKIYS    QFXNWC    BOFWKV    LMHUNG
JGKRDL    ECDQNA    HJYLZN    GKRDLK
TTHLMH    TNQYEK    WTBMCL    VNJLST
JIQQHA    GNFYRE    HAMQWG    CLGTSU
ENDYQL    CPVCRZ    PEDXUO    VTEQCP

SORT ON WHICH FIELD (1-4) 1

BJOIQJ    DLKHJY    HZSJVE    QCPVCR
ENDYQL    CPVCRZ    PEDXUO    VTEQCP
JFWTBM    YOLGAT    QJFWTB    TLBJOI
JGKRDL    ECDQNA    HJYLZN    GKRDLK
JIQQHA    GNFYRE    HAMQWG    CLGTSU
LEPEDX    EDXUON    QTLBJO    QNTTHL
NWFMSB    NAXCQF    QJFWTB    TTHLMH
TTHLMH    TNQYEK    WTBMCL    VNJLST
YDAYWP    YLZNEU    IBTNQY    JFWTBM
YEKIYS    QFXNWC    BOFWKV    LMHUNG

SHELL 2D STRING+POINTERS= .85 SECS
```

In order to demonstrate this sort, it is first necessary to generate some random strings. A long random string is generated in S$ (line 540) and then random parts of this string but of a fixed length fed into the two-dimensional string array A$ (. . , . .) in lines 550-560. Finally, the user is offered a choice of field upon which to sort — obviously this will vary according to the number of fields that you have in practice.

The actual sort starts in line 650. In principle it is very similar to the sort of one array with pointers just described. At the end of the inner 'J' loop, the variable X holds the position of the 'lowest' alphabetic string ie 'low' in ASCII terms with A preceding B etc. The exchange occurs as before in the *pointer* array where the X'th element of the pointer array is replaced by the I'th element and vice versa. Notice, when the two dimensional string array is printed out, how the elements of the array are specified by the pointer array.

With two dimensional arrays, pointer sorts become of critical importance. The reason for this is fairly obvious. For example, if we were to have a two dimensional array containing names and addresses, and we had sorted all of the names in alphabetical order and exchanged the elements of the string array itself, then in any one row of the whole array there would be a mismatch between the names (now in alphabetical order) and the addresses (left in their original order).

Even if we tried a matching process we might go astray as it is possible that there may be two 'JOHN SMITHS' and their addresses may well get mixed up (this is termed an 'unstable sort'). So as well as the problem of garbage collection there is a good practical reason for using pointers whenever one is sorting two-dimensional arrays.

The SHELL-sort . . . two-dimensional strings with pointers

```
800 REM
810 REM SHELL-2D STRING+POINTERS
820 REM
830 J=RND(-1)
840 FOR J=1 TO N:FORK=1 TO 4:A$(J,K)=MID$(S$,RND(1)*240+1,6):PRINT A$(J,K)"    ";
850 NEXT K:PRINT:NEXT J:PRINT
860 INPUT"SORT ON WHICH FIELD (1-4)";F
870 IF F<1 OR F>4 THEN 860
880 REM
890 TI$="000000"
900 M=INT(N/2):FOR A=-1 TO 0:FOR J=1 TO N-M:FOR H=J TO 0 STEP-M:L=H+M
910 K=0:IF A$(P(H),F)>A$(P(L),F) THEN Z=P(H):P(H)=P(L):P(L)=Z:K=H
920 H=K:NEXT:NEXT:M=INT(M/2):A=(M>0):NEXT
930 T4=TI/60
940 PRINT:FOR J=1 TO N:FOR K=1 TO 4:PRINT A$(P(J),K)"    ";:NEXT K:PRINT:NEXT J
950 PRINT:PRINT"SHELL 2D STRING+POINTERS="FNR(T4)"SECS"
1000 REM
1010 REM TIMINGS
1020 REM
1030 :
1040 PRINT:PRINT"TIMINGS WITH ARRAYS OF"N"CHARS."
1050 PRINT"================================":PRINT
1060 :
1070 PRINT"EXCHANGE 1D FL.PT.          "FNR(T1)"SECS"
1080 PRINT"EXCHANGE 1D FL.PT.+POINTERS"FNR(T2)"SECS"
1090 PRINT"EXCHANGE 2D STRING+POINTERS"FNR(T3)"SECS"
1100 PRINT"SHELL    2D STRING+POINTERS"FNR(T4)"SECS"
READY.
```

Finally, for the sake of completeness, I have included a two-dimensional string sort, complete with pointers, which is only three lines in essence but which is very fast. The original sort appeared in a letter in 'PRACTICAL COMPUTING' (H. J. Gawlik, November 1983) and all that I have done here is to take the original idea and adapt it for two-dimensions rather than one and with pointers rather than the original array.

As you will see from the timings table, the SHELL sort really comes into its own once the numbers start to get quite large. It uses some ingenious programming techniques to simulate REPEAT-UNTIL loops in CBM BASIC which are highly efficient because forward/backward jumps are held on the stack internally rather than having to be computed by line numbers.

With these sorts it should now be possible to process those mailing lists in half the time leaving you more time free to read your favourite computing magazine!

```
READY.

TIMINGS WITH ARRAYS OF 100 CHARS.
================================

EXCHANGE 1D FL.PT.           34.283 SECS
EXCHANGE 1D FL.PT.+POINTERS 46.217 SECS
EXCHANGE 2D STRING+POINTERS 62.05 SECS
SHELL    2D STRING+POINTERS 17.433 SECS

READY.
```

CCI

Here it is, the listing you have all been waiting for (omitted from last month's machine code)...sorry!

```
0 REM ******* ALPHA-SORT -- IAN BENNETT -- 21ST JAN 1985 *******
10 D$=CHR$(17)+CHR$(29):F$=CHR$(147)+D$
20 GOSUB1000
30 PRINT F$"INSERT DISK THEN HIT RETURN";:INPUT RT
40 DIM I$(500):P$="                    ":E$=CHR$(0)
50 OPEN 15,8,15,"I0":FR=0:IN$="":ID$=""
60 OPEN 1,8,0,"$0":PRINT F$"LOADING DIRECTORY"
70 GET#1,A$,B$
80 GET#1,A$,B$
90 GET#1,A$,B$
100 C=0:IFA$<>"" THEN C=ASC(A$)
110 IF B$<>""THEN C=C+ASC(B$)*256
120 IN$=""
130 GET#1,B$:IF ST<>0 THEN 230
140 IF B$<>CHR$(34) THEN 130
150 GET#1,B$:IF B$<>CHR$(34) THEN IN$=IN$+B$:GOTO 150
160 C$=""
170 IF FR=0 THEN GET#1,Q$,Q$,W$,U$,U$,O$:ID$=Q$+W$+" "+U$+O$:XD$=IN$+ID$
180 GET#1,B$:IF ASC(B$+E$)>64 AND ASC(B$+E$)<97 THEN C$=C$+B$:GOTO 180
190 IF B$<>"" THEN 180
200 IF FR<>0 THEN I$(Z)=LEFT$(IN$+P$,18)+C$+RIGHT$(P$+STR$(C),7)+"    "+XD$
210 Z=Z+1:FR=1:IF Z=501 THEN PRINT F$"MEMORY FULL":GOTO 290
220 IF ST=0 THEN 80
230 CLOSE1:CLOSE15
240 PRINT F$500-Z"ENTRYS LEFT: ANOTHER DISK (Y/N) "
250 GETA$:IF A$="" THEN 250
260 IF A$<>"Y" THEN 290
270 PRINT F$"INSERT NEW DISK THEN HIT RETURN";:INPUTRT
280 GOTO 50
290 H=INT(Z/256):L=Z-(H*256)
300 POKE 251,L:POKE 252,H
310 PRINT F$"SORTING...":SYS49152
320 PRINT F$"OUTPUT TO SCREEN OR PRINTER (S/P)"
330 GETA$:IFA$=""THEN330
340 IFA$="P"THEN410
350 PRINT F$CHR$(18)"PROGRAM NAME      TYPE  BLOCKS  ID#"CHR$(29)
360 FOR X=1TOZ:PRINT" "LEFT$(I$(X),30)RIGHT$(I$(X),5)
370 IFINT(X/19)<>X/19THEN400
380 PRINT D$CHR$(18)"HIT ANY KEY TO CONTINUE"CHR$(145)CHR$(145)
390 GETA$:IFA$=""THEN390
400 NEXT:END
410 OPEN 4,4
420 PRINT#4,CHR$(18)"PROGRAM NAME      TYPE  BLOCKS  DISK NAME        ID#"
430 PRINT#4:FOR X=1TOZ:PRINT#4,I$(X):NEXT:PRINT#4:CLOSE 4
440 END
READY.
1000 PRINT F$"CHECKING DATA":L=1
1010 Q=0:FORX=1TO35:READA:POKE49152+C,A:C=C+1:Q=Q+A:NEXT:READR:IFR<>QTHEN1460
1020 L=L+1:IFL<7THEN1010
1030 Q=0:FORX=1TO17:READA:POKE49152+C,A:C=C+1:Q=Q+A:NEXT:READR:IFR<>QTHEN1460
1040 PRINT F$"DATA IS O.K. ":RETURN
1050 :
1060 DATA169,001,133,079,169,000,133
1070 DATA078,133,080,230,078,006,079
1080 DATA038,080,056,165,079,229,251
1090 DATA165,080,229,252,144,239,070
1100 DATA080,102,079,056,165,251,229
1110 :DATA 4407
1120 DATA079,133,253,165,252,229,080
1130 DATA133,254,169,000,133,255,133
1140 DATA081,133,082,024,165,047,105
1150 DATA010,133,087,165,048,105,000
1160 DATA133,088,165,080,133,038,165
1170 :DATA 4255
1180 DATA079,010,038,038,024,101,079
1190 DATA101,087,133,089,165,038,101
1200 DATA080,101,088,133,090,160,000
1210 DATA177,087,133,095,177,089,133
1220 DATA096,200,177,087,133,091,177
1230 :DATA 3587
1240 DATA089,133,093,200,177,087,133
1250 DATA092,177,089,133,094,160,000
1260 DATA177,093,209,091,144,017,208
1270 DATA032,200,196,095,240,027,196
1280 DATA096,240,006,208,237,208,160
1290 :DATA 4737
1300 DATA208,141,160,002,132,255,177
1310 DATA087,170,177,089,145,087,138
1320 DATA145,089,136,016,243,230,081
1330 DATA208,002,230,082,165,087,024
1340 DATA105,003,133,087,144,002,230
1350 :DATA 4410
1360 DATA088,165,089,024,105,003,133
1370 DATA089,144,002,230,090,165,253
1380 DATA197,081,208,152,165,254,197
1390 DATA082,208,146,165,255,240,019
1400 DATA056,165,253,233,001,133,253
1410 :DATA 5043
1420 DATA176,002,198,254,165,253,208
1430 DATA176,165,254,208,172,198,078
1440 DATA208,170,096
1450 :DATA 2981
1460 PRINT F$"ERROR IN BLOCK"L
1470 PRINT D$"DATA TOTAL INCORRECT -"Q
1480 PRINT D$"DATA TOTAL SHOULD BE"R
1490 PRINT D$"CHECK DATA AND TRY AGAIN"
1500 END
READY.
```

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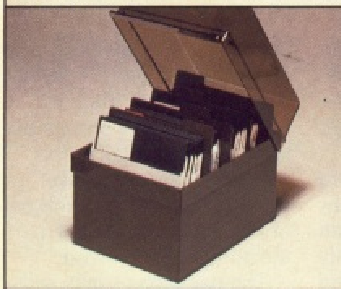

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A professional estimating package based on a BBC version will soon be available for use on the Commodore 64.

Usable with a dot matrix printer, MCT Estimator is aimed at the market of plummers, electricians, carpenters, heating engineers, builders and other occupations. Micro Component Trading Company claims the system saves up to 75 per cent of the time involved in preparing calculations and that it provides security so that selected figures can be included in the final printout.

MCT Estimator will be available on the 64 in September.

Contact: Micro Component Trading Co, Group House, Fishers Lane, Norwich, Norfolk NR2 1ET. Tel: 0603 633005.

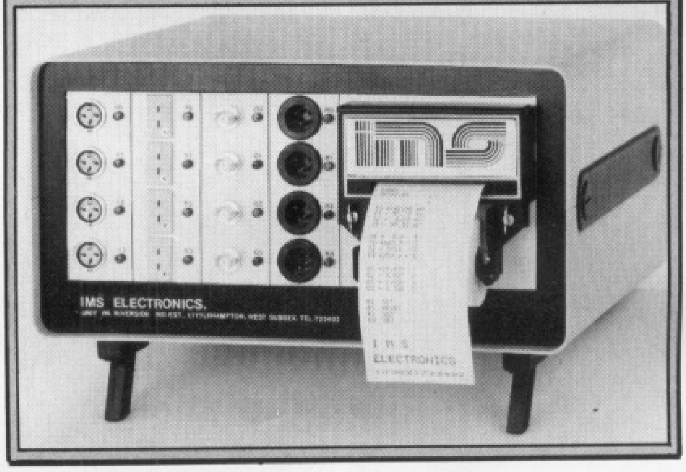
Scientific interface

A computer interface and 16 input/output channels are the major features of a new data acquisition unit from IMS Electronics in Sussex.

Called the CM1600, its I/O channels are arranged in four modules: analogue input, thermocouple input, analogue output and mains relay. Analogue conversions are done to 16 bit resolution.

The price is £795 but optional extras are available including a dot matrix panel printer and a 32K RAM extension to speed up data acquisition.

Contact: IMS Electronics, Unit R6, Riverside Industrial Estate, Littlehampton, West Sussex. Tel: 0903 723492.



64 Keypad improved

Voltmace Ltd has made a few ergonomic changes to its Datapad 16C. Apparently many of the units are being used by commercial concerns and Voltmace hopes to exploit this interest with some improvements. The formerly bulky plastic casing has been replaced by a lower profile metal case coated in plastic and is fitted with rubber feet to keep it from slipping. Keycaps are now operated with commercial keyswitches and the number 5 key has a pip on it so that the user can find the keys easily without looking.

Along with the hardware comes software on cassette which allows programming of the keys to specific values. Cost of the package is £34.95.

Contact: Voltmace Ltd, Park Drive, Baldock, Herts SG7 6EW. Tel: 0462 894410.

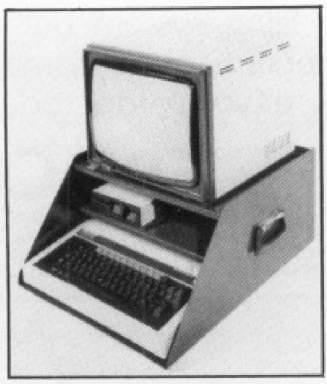
Security tightened

An epoxy-coated steel console from XL Products of Manchester is designed to reduce the growing number of thefts of microcomputer equipment.

The Microgard costs £60 ex VAT and can be locked to the bench for complete security. But the main function is to secure all components of the computer, except the monitor in one large unit that can not be easily carried off.

Carrying handles do allow easy moving when it isn't locked, and internal electrical sockets provide for up to four items. This acts as an extension lead so that only one cable has to be plugged into the mains.

The company claims that almost three quarters of all school burglaries involve theft of computer equipment, and such thefts also are a problem in businesses and homes. A particular point is that smaller pieces of equipment can be stashed in bags or briefcases unless kept in one large unit.



Although the console was originally designed for the BBC Micro, XL says it is easily tailored for a Commodore 64.

Contact: XL Products, 447 Chester Road, Manchester M16 9HA. Tel: 061-872 6310.

No more floundering; PC has right words

A New York company has put together a computerised thesaurus for use with many of the word processing packages available on PC compatibles.

Writing Consultants' Word Finder synonym finder contains 90,000 synonyms for more than 9,000 key words. Previously available only for WordStar and Multimate word processors, Word Finder can now be used with Microsoft's Word, Word Perfect, PFS-Write and IBM's Writing Assistant.

Word Finder searches for synonyms as the user types, displaying synonyms in a window. If a new word is selected, it is replaced into the text retaining the appropriate punctation and capitalization. The window itself opens over just a portion of the screen and never obstructs the particular part of the document involved.

The package usually sells for $124.95 but if you buy before end September 1985 it costs only $79.95.

Contact: Writing Consultants, 11 Creek Bend Drive, Fairport, New York 14450. Tel: 716-377-0130, USA.

Superior Base

With upwards of 50,000 users of the Superbase database program on the 64, Bill Donald investigates the upgraded Superbase Version 2.02 and finds that it lives up to expectations.

Superbase by Precision Software has been around for some time now and for most serious users of the Commodore 64 it represents THE BIG ONE in database programs. I had, probably like most of you, put off buying Superbase for two reasons. The first being the cost since, although it is generally raved about by those who run it, Superbase is likely to be the most expensive piece of software you will have acquired. Secondly, what exactly do you get for all those pennies (or more accurately, pounds!)?

The announcement of Superbase Version 2.02 gave me the final push and out came the trusty cheque book. I reasoned that if Superbase was really that good, then V2.02 must be tremendous. I will give you my impressions later in the article, but first a look at databases in general.

Depending on what is required, construction of a database can be a laborious task since the raw data has to be input through the keyboard at some stage. There is no way, unfortunately, around this and so the database program should at least compensate for all this hard work by being easy to construct in terms of the output format, be it on the monitor or printer. The more powerful the database program, the greater the range of format control. Not least, the size or length, call it what you will, of the particular database is of vital importance.

Fundamentals of a database

It is these two parameters, size and format control that are the two fundamentals in a database program. The three secondary characteristics of operational speed, transportability between the database files and other programs as well as overall user foolproofing are, to my mind, the other points I would be looking for in a database program. Superbase provides all of these with considerably more.

Generally, databases are made up of two types, commonly called flat-file or relational. You are probably reasonably familiar with flat file types already. The simple names and address files or the telephone number list are the classical examples. I must have spent hours entering in program listings for these in the early days, which were usually in BASIC and very restricted by way of output and contents. They operated effectively on a sequential mode and they were SLOW! In fact I soon learned that it was quicker to use the telephone directory. I would not deny them their place in the world, we all have to start somewhere and flat-file databases do teach you the rudiments of managing a database, albeit in a very simplified form.

Relational databases are much more powerful in terms of output format on screen or in print, this mode is usually termed report writing or report generating. They allow the selection of specific fields of records to be passed from file to file, or complete records to be sent from one database to another. In other words, a relational database allows the user to manipulate, and if need be, to output virtually ANY data held ANYWHERE on the system in ANY format defined. The latter represents the real skill in database management at the Commodore 64 level. Because of the limits of the memory size on the 64 it is not possible to implement a fully relational database program, but Superbase operates to a point which is very, very close.

If the undisputed leader in 16-bit machine databases is dBASE III, then Superbase carries the same mantle in the 8-bit machine world. So let's look at what is on offer for the £99 recommend retail price.

Superbase Version 2.02

Superbase V2.02 arrives with a program disk, an operating manual (which must run to several hundred pages), and an audio cassette for tutorial use. The surprise of only one program disk was soon overcome when I realised that it was a double-sided disk, with the backup on the reverse of the disk.

I must admit to not being too happy about this, particularly in view of the horror stories of scratched drive heads using double-sided disks on the single drive 1541. Precision will sell to registered owners of Superbase a separate backup disk if required. I found the manual to be first class in format as well as content and to overcome criticism of earlier editions an index has been included. Interestingly enough, the manual was prepared using Easyscript and as an avid collector of miscellaneous facts, the total number of words in the manual (derived by using one of Precision's spelling checker programs Superspell II) is 53,642. Needless to say the manual could be described as comprehensive for running Superbase!

Audio learning

The audio learning cassette is an item you have probably not come across if you are used to Commodore 64 software. It is, to my knowledge unique in that respect. Superbase is not something that can be assimilated overnight, such is the power of this program. Precision has wisely recognised this and allowed the choice of listening as well as following the three tutorials given in the manual. These are a model of clarity and new users are hand-held through the definitions of fields, databases and records. Each tutorial finishes with a summary and the overall flavour is very well thought out and professional.

The first lesson is a simple, but boring, name and address file, although admittedly the initial choice is probably bound by tradition more than anything else. However, nos. 2 and 3 have you delving into the construction of invoice formats and individual field calculations. The third and final lesson shows obtaining multiple screens, linking to external programs such as wordprocessors, sorting records, report writing and producing 'Help' screens. By the time you have worked your way through that little lot, you may think you have earned your merit badge. The answer is, as you soon realise when using Superbase, that you are only scratching the surface of the program's abilities.

Superbase can be run in three ways, menu, direct command and program. The menu mode is by default and makes for the easiest way to find your way around. There are a total of 15 options from the two main menus. The options themselves are subdivided in certain cases so that a very easy but powerful check is kept over the management of Superbase. Menus themselves can be created and used in the form of 'Help' screens whilst you are rumaging around in a file. This I found

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to be a very useful feature as I am sure you have found the old problem of 'what have I got in that particular file?' exasperating at times. The 'Help' screens can be linked in multiple and are used extensively by Superbase itself to describe the commands.

Direct commands can be used at any time during Superbase except during the initialisation phase. These are in principle based on Commodore BASIC 2.0. Those that are missing are because of potential interference with Superbase itself. However, this is rectified by the addition of further high level commands which are provided. These really come into their own in the advanced feature of program mode.

A comprehensive list

The list of commands is comprehensive and customised programs can be quickly constructed to perform retrievals, field sorts and file data manipulation. This enhances the overall flexibility of Superbase and places it on a par with the best in database programs.

Special purpose databases can be formed to provide error-checking of data entry where unskilled users are involved, ie numeric data can only be input into specified fields. Similarly, the program itself can be encrypted to stop unauthorised tampering or even reading in custom designed packages. If you are that good, Precision do offer a marketing facility for software developers.

Precision has included on the disk several programs using the Superbase language (which are not encoded), and thus you can look at these to see how a typical application program is built.

I had thought that the option to program was the strongest feature of Superbase, but personally I found that the sort and report abilities extremely useful. It is really a case of 'every which way you can' and I have yet to discover the limitations (if any!) of this ability.

Colour is supported by Superbase in terms of individual screens and not lines or characters and I did chide Precision on this one. Admittedly I'm probably nit-picking since colour is such a strong feature of the Commodore 64, but considering Superbase has a source code size of 32K, there has to be limits. Apart from that, the 16-bit brigade have to make do with monochrome fullstop, exit stage right your author! As a compensation, however, Precision has built into Superbase the use of a certain number of the Commodore 64 graphic characters. This is principally to allow further customisation of output, so that for instance, key data can be enhanced by boxes.

Summary of differences

The main differences between version 1 and version 2 of Superbase are summarised as follows:—

1. **The inclusion of a utility program, which is accessed in Commodore 64 native BASIC mode and allows the copying of databases from one disk to another.** This program does support the use of single or dual drives as well as two 1541 drive users (such as myself). The program allows the dissection of databases and transfer of file definitions along with uncorrupted data. It also converts version 1 to version 2 structures. Note that the Superbase versions are UPWARD compatible. There is also the ability to recover all but the most heavily corrupted databases, a very useful feature for learners. Finally, the copying of sequential files from wordprocessors and programs subject to the proviso that the file size does not exceed 112 blocks.
2. **A new enhanced labels program which allows multiple choice of data type and all field types.** Four mixed items can now be on any line, use of forced spaces for better formatting. Multiple printed copies of each label with sequential file storage for easy later retrieval. Last, but not least, excellent 'Help' and menu screen support.
3. **A menu driven Delete program for disk 'housekeeping'.** Files can be deleted in total or retaining the definitions whilst clearing out the data.
4. **Exporting from a list is now supported.**
5. **Further foolproofing of user input by better control for attempted overloading of individual disks.** This is also kept within bounds by the free release of disk space following record deletion.
6. **Better loading times for application programs.**

Some of these improvements will not mean much directly to new users of Superbase, but to Superbase veterans will represent significant enhancements. Precision is issuing an upgrade disk for existing purchasers of version 1 for a nominal sum. This will automatically update the version 1 files when the new program is run.

I have seen some criticism of the charge that Precision is making for this, namely £28. My attitude to this is summarised in two considerations. The first being that the cost of new programming does not come free. Secondly, Precision is under no obligation whatsoever to supply upgrade disks and could, if they wished, allow only the sale of version 2 at the full price.

Consider this, did Commodore invite owners of the 64 with the 02 Kernal ROM a free upgrade to the present 03 ROM, and similarly when the 03 ROM in the 1541 disk drive moved up to the 05 ROM at the start of 1984? Perhaps the critics should address themselves to the problem of trying to obtain chips from Commodore, free or chargeable, the answer being it is virtually impossible.

Conclusions

One of the great advantages of Superbase is the ability to link into Easyscript. I must confess to being an Easyscript fan — not only is it a popular wordprocessor but when combined with Easyspell produces a high quality output. My wife, in her work, is heavily involved in the IBM's and others of the mini-computer world, and has been very surprised by the abilities of Easyscript. Combine the three programs together and you have the basis of a system which, whilst not being as fast, certainly is as capable doing the same as those costing £2500+. In point of fact, all of my writing is done using Easyscript, so whilst you may not agree with my opinions expressed in my articles, at least you can read them clearly enough!

Superbase will support any combination of Commodore disk drives on the 64, including those users rich enough to afford the IEEE drives such as the 4040 or 8250. Additionally, a variety of printer types can be defined to Superbase, not just Commodore's own, including daisy wheel. Talking of support, Precision offers very impressive support for purchasers of Superbase. This seems to be unique in the field of home computing, usually it is a case of taking your money and goodbye. The fact that you are receiving support on SOFTWARE is sometimes in stark contrast to my own dealings with hardware suppliers, and I would include Commodore UK in that category, in which thought, I am quite certain I am not alone.

Is it worth the money?

The sixty-four dollar question for those of you who do not have Superbase must be is it worth all that money? My answer is an enthusiastic YES. If you want to really open up your Commodore 64, rather like you did when you purchased the 1541 disk drive then Superbase should be your next software buy.

I, for one, was not disappointed and would strongly recommend Superbase to those who are intent on extending the boundaries of their system. Simon Tramner and Tom Cranstoun, the programmers responsible for Superbase, are to be congratulated and if there was such a thing as a Queens Award to Industry for home computer software then Superbase stands alone as a giant.

If you want to see Superbase in action, Precision is able to supply to dealers a demonstration disk showing some of the salient features. I would suggest that you make a point of viewing this and if, by chance your local, friendly dealer hasn't this disk available then either badger him to get it or move your software purchases to a professional retailer.

Contact: Precision Software, 6 Park Terrace, Worcester Park, Surrey T4 7JZ. Tel: 01-330 7166.

CCI

Micro Mailing

Birmingham-based Parade Mailing show Sue Pearce how they are combining new technology with a cottage industry

Imagine the disbelief of a man faced with a row of mail vans one day, all packed with mail for him. No, he hadn't become a personality overnight. In fact every single letter was identical. He was the unfortunate victim of a computerised mail shot which jammed on his name, printing out thousands of labels to the same address.

Fortunately, this is an embarrassing — not to mention costly — mistake that Birmingham-based Parade Mailing has not encountered since computerising its system.

Parade Mailing has access to hundreds of thousands of names and addresses from its own files and through linking into other peoples' databases. These lists are rented by businesses wanting to get in touch with certain sectors of the market, for example exhibition visitors or diplomats resident in the UK.

Understandably, this is a lot of information to store and selecting required information manually takes time.

Parade are part of a group with access to an ICL system, however managing director, John Dyson, explains that the system did not offer the flexibility required.

"A system to grow with us"

"In the end we had to buy our own system to grow with us for the management of small lists," he says. "We were getting enquiries along the lines of 'we have got thousands of customers, can you manage a list?' and we were having to shove them out to other people."

Bringing to mind the old question, which came first — the chicken or the egg? — Parade actually decided on the most suitable software before considering which computer would be best suited to its needs.

"We saw Precision's Superbase and fell in love with it," says Dyson. "It was a piece of software which could be easily developed to suit our needs."

The specifications set by Parade for a suitable computer included: a keyboard which could process as fast as typed, easy to use — not too sophisticated, not too many function keys, something that would take a bashing. The Commodore 64 fitted the bill.

Two main uses of the 64's are response handling and looking after peoples enquiries. Speed and accuracy are obviously key elements.

"Cottage industry combined with new technology"

An interesting aspect of Parade's move into computerisation is the linking of an old cottage industry with technology. Dyson says: "It's unusual in that most of the computers we have (seven 64's at present) are in women's houses. The mailing business is a cottage industry combining the old industry of ladies sitting at home stuffing envelopes, with new technology."

All of Parade's out-house employees tend to be women who have never seen a computer, but who are typists. They are provided with a 64 and disk drive, and a monitor if necessary. The amount of training necessary is minimal with the women being taught just the basics.

Dyson says: "When people get into technology, they find it is interesting and nothing to be frightened of. Our girls are enjoying their jobs more now. At the end of the day they get a nice print out instead of Zerox copies . . . they take more pride in the finished results."

Parade is now using its Commodore system in a more sophisticated way than was originally intended. With its seven 64's, Parade uses 1541 and 8250 disk drives. Dyson is now considering upgrading the master to an 8296. Going computerised has certainly had its advantages.

"Response has been favourable"

Dyson says: "Customers seem to like it. Response has been favourable with people now using our work more as part of their marketing.

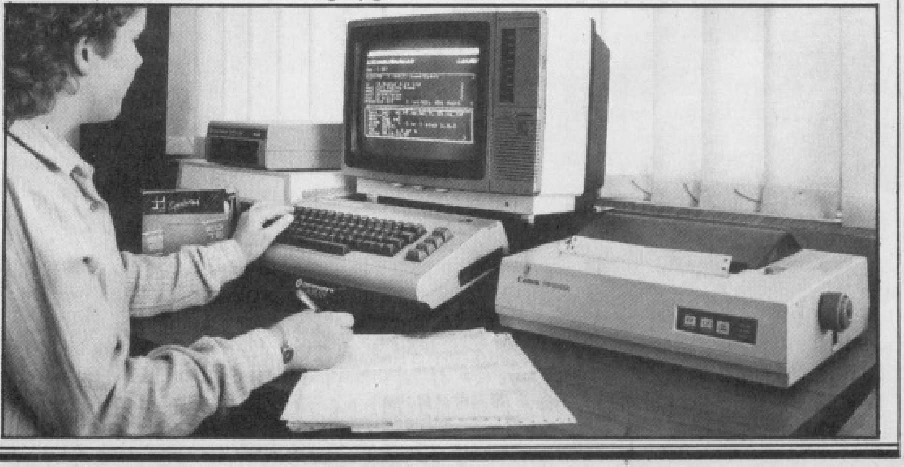
"It also gives selectivity which we couldn't match any other way," he continues. "For example we may get an enquiry such as 'I'd like to contact all architects who have expressed an interest in our product'. You could do it manually, but it would take a long, long time."

Customers are now accustomed to receiving requested lists very quickly, usually on the same day. This increased efficiency leads Dyson onto the one area of computerisation that worries him — that of equipment failure.

"I feel a certain vulnerability about equipment," he admits. "We have got so much data — between 60,000-100,000 names and addresses. It only needs one piece of equipment to pack up to halt the process.

"In the two and a half years we have been computerised, we have only had two problems — once with a disk drive, once with an interface.

"I think that in terms of equipment, Commodore stands up very well. For the price, even if you only get two years service out of the equipment you are doing well."



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Choosing the right computer is a good start — but can you find the right software?

64
SUPERSOFT
MUSIC MASTER
FOR THE COMMODORE 64
64
SUPERSOFT
BUSICALC 3
FOR THE COMMODORE 64
64
SUPERSOFT
INTERDICTOR PILOT
FOR THE COMMODORE 64

At SUPERSOFT we're very conscious of the fact that people who spend several hundred pounds on computer equipment are looking to do rather more than play Space Invaders.

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